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approach

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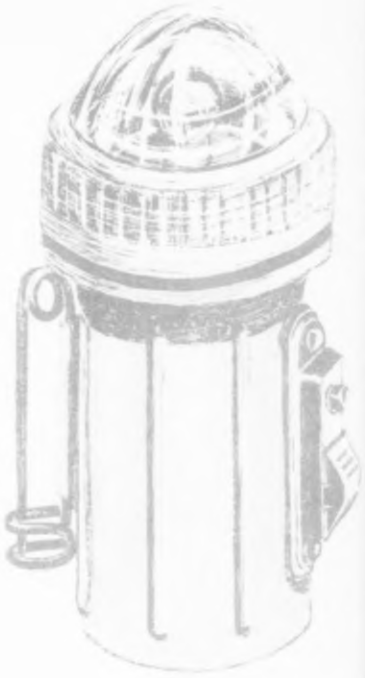

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LETTERS

Life Vests—Close the Valve

Sir:

We agree with you that the life vest is one of the most important pieces of survival equipment when flights are made over water. But equally important is the correct procedure for using it. I am referring to the November issue of APPROACH, page 24, titled "Life Vests." Here you listed a reference (BACSEB 25-58A) which has nothing to do with life vests. This bulletin applies to *Personnel Ejection Catapult Firing Mechanism.* Secondly the item stated that the oral inflation valve should be LOCKED (screwed out) to prevent air from getting into the life vest and expanding at altitude. This is in direct contradiction to BACSEB 22-58A which states that prior to flight, the wearer should examine the oral inflation valve to insure that the mouthpiece is UNLOCKED to permit immediate oral inflation in an emergency.

Both methods have logic. Would you comment further on this subject?

A. P. ULANSKI, M/SGT.

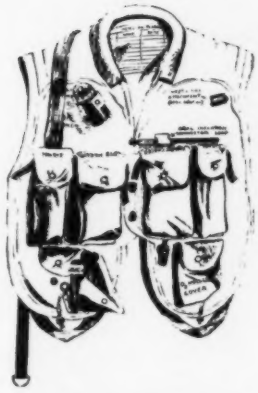
H&MS-24, MAG-24
MCAS, Cherry Point, N. C.

● See answer to next letter.

Sir:

In the November issue of APPROACH, the article concerning Life Vests referenced BACSEB 25-58A. Should this have read BACSEB 22-58A?

The info concerning the oral inflation valve read "when flying you should have the valve LOCKED (screwed out) to prevent air from getting into the life vest and expanding at altitude. In the water, the valve is normally kept in the



same LOCKED (screwed out) position."

According to BACSEB 22-58A Paragraph 5b (f): "Examine the oral inflation valve to insure that the mouth-piece is UNLOCKED to permit immediate oral inflation in an emergency." Paragraph 6 is quoted in part: "If the vest requires frequent oral topping off to maintain flotation, the mouthpiece may be left UNLOCKED. It is generally desirable, however, to LOCK the oral inflation valve after inflation to prevent accidental or unintentional operation of the valve and release of air."

There seems to be some conflict concerning the position of the oral inflation valve in my opinion.

NAAS Ream Field

R. J. DAWSON

● You caught our proofreaders on the first point. It should be BACSEB 22-58A.

On your second point: The APPROACH statement is correct. BACSEB 35-58 of 16 December 1958, "Inflatable Life Preservers and Inflatable Life Rafts; deflation of," superseded parts of BACSEB 22-58A. BACSEB 35-58 states "All personnel using or handling inflatable equipment are to be informed of the importance of thorough deflation and of the importance of maintaining deflation by keeping all valves closed at all times (particularly the oral inflation tube valve) . . . Deflate oral compartments; use suction pump to completely collapse compartments; screw lock oral inflation tube."

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.

Foreign Objects—No Joke

Sir:

Being an ardent reader of APPROACH, and familiar with the problem of foreign object damages, I was quite overcome when I noticed the enclosed newsclipping.

Being unable to caption it appropriately I send it to you for your enjoyment, hoping that you find it as amusing as I did.

DONIS E. RICE, CAPT. INF.

21st Aviation Co.
Fort Rucker, Ala.

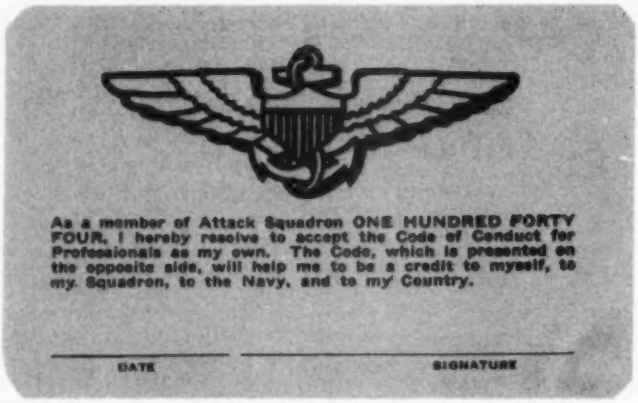
● The newsclipping photo from *Columbus (Ga) Enquirer* exhibited 258 objects swallowed by a 56-year-old mental patient at Brooklyn State Hospital. The objects included $19.19 in change, a corkscrew, rosary beads, 26 keys and 5-inch wrench, all of which were removed during an operation. To this we add—jet engines have tremendous appetites but operations seldom save their lives.

How We Do It

Sir:

Concerning comments and devices used on the squadron level to promote aviation safety: We have just completed a seven-month, mishap-free deployment to WestPac, producing 2527 hours, 813 day arrestments, and 178 night arrestments in the FJ-4B. Finally, now that the superstition about ruining a no-hit game has been removed, and more time is available for looking backward, I will pass along what few items seem to have been proven successful other than the universally accepted programs of posters and lectures.

With a tip of the hat to NASC and APPROACH, the Code for Professionals was plagiarized to produce a squadron version. Each pilot



As a member of Attack Squadron ONE HUNDRED FORTY FOUR, I hereby resolve to accept the Code of Conduct for Professionals as my own. The Code, which is presented on the opposite side, will help me to be a credit to myself, to my Squadron, to the Navy, and to my Country.

DATE _____ SIGNATURE _____

CODE OF CONDUCT FOR PROFESSIONALS

I will accept the responsibilities as well as the rewards of authority.

I will so conduct myself at all times as to merit the confidence and respect of my fellows, associates and superiors.

I will consider the acquisition of skill and knowledge of my profession as a never ending process and will accept the responsibility of study, research and investigation in my field.

I will faithfully discharge the duties assigned me to the best of my ability.

I will keep uppermost in my mind the safety and well being of those who depend on me.

I will conduct my affairs with others in such a manner as to bring credit to the Navy, to aviation, and to myself.

thus became a card-carrying member of an organization dedicated to the avoidance becoming the subject of an (AAR) investigation.

Everybody has a pre-accident plan, and we think highly of ours, but by nature they are after-the-fact doctrines. In the effort to make ours useless, we put together our Non-Accident Plan, and still carry it out.

Many sound policies were backed by the commanding officer, and although most of them naturally tended to pertain to type particularities such as asymmetrical take-offs and landings and generator failures, a lot of excellent general doctrine was established. It is safe to say carrier types are a proud lot, and justly so, but going on the assumption that bolter is better than a strike, no derogatory comments were ever permitted, even in jest, to cause a pilot to "get aboard" rather than accept the high meatball or pitching deck go-around. The old policy of being set up for the approach when abeam was stressed, with the added enforcement of some command-supported measure when any pilot was detected trying to salvage an obviously poor approach rather than taking a voluntary wave-off. Along the same line, no "liar's dice" or deviation was permitted on landing fuel weights in order to have a little extra or to avoid a BINGO.

To keep supposedly obsolete aircraft on their third cruise would seem to be enough to require an outstanding maintenance department, but in the light of already reduced design safety margins caused by age, increased loadings, and night operations, a hard policy was inaugurated that refused to let minor gripes mount up or keep flying. Extra hours were required, but even on the last days of the cruise, Maintenance provided us with 100% availability.

Enclosed are copies of the cards, plans, a briefing guide, and our detailed landing weight chart. Here's hoping some more good can come from the collection.

E. C. PARKER, JR., LT
Safety Officer, VA-144

FPO San Francisco

Check and Double-Check

Sir:

NavAer 06-5-502 says, ". . . the correct fuel must be delivered to the aircraft. An engine designed for a high performance aviation gasoline will not operate with jet fuel or with low octane number gasoline. Similarly, a jet engine adjusted for JP-4 fuel will not usually perform properly with aviation gasoline for fuel. The delivery of the wrong fuel is one of the most serious mistakes which can be made, but it can be easily avoided by constant alertness and attention on the part of fuel handling personnel to established operating procedures"

There are standard procedures in use which are designed to assure against mistakes resulting in delivery of the wrong fuel. The Fill Stand Operator is responsible for delivery of the quality and type of fuel plainly marked on the side of the truck. The refueler truck driver is further responsible to draw only that type. This is a double check. Upon arrival at the aircraft the Plane Captain has a responsibility to examine the fuel the truck proposes to deliver, and then personally authorize its delivery. His joint inspection with the truck driver is another double-double check. A quality control check of the fuel carried by each truck is conducted daily, and all these checks should constitute a fool

Cut APPROACH In!

Has information in APPROACH magazine ever helped you prevent an accident—prevent an injury—or better handle an emergency?

If so, and you have not reported it to NASC already, it is particularly important that you do so. This information is vital to both editorial direction and fiscal support of the magazine.

proof system to prevent delivery of the wrong fuel. But the system can collapse, as an instance which occurred not long ago proved.

The newly qualified refueler driver arrived at the Fill Stand to find that no Fill Stand Operator was provided after normal working hours, so he undertook to refuel his own truck. Accidently, he pumped 775 gallons of JP-5 into his 3000-gallon capacity truck, which otherwise contained 115/145 AvGa. He subsequently made two fuel deliveries to aircraft, one of 517 gallons, and another of 195 gallons. Both were large multi-engine aircraft with large fuel capacities, and both conducted flights with no adverse effects. After each delivery, the refueler driver topped off the truck with the proper fuel, thus partially restoring some of the quality that had been lost. The third delivery was to an R6D. This Plane Captain, like the other two, refused a fuel sample, and none was pumped. Delivery of the contaminated fuel was then begun, but during the refueling it was discovered that an error was being made. Refueling was stopped, and corrective action was initiated.

Since the specific gravity made upon discovery of the refueling error showed the fuel to be above the minimum allowable, it is probable that no accident would have resulted. Nevertheless, the danger of a recurrence wherein an unacceptable fuel might be delivered which could cause an accident gives proper cause for grave concern.

Accordingly, NAS Alameda has taken action to institute still another prevention to the delivery of contaminated fuel. The fuel storage tanks are locked, and are only unlocked when the refueler driver presents his key. The key to the refueler ignition and the appropriate fuel tank storage tank key are welded together on the same ring. This is expected to be a positive prevention to the delivery of the wrong fuel.

Nevertheless, glass bottles are carried in each refueler truck, and drivers, in compliance with NavAer 06.15, automatically present a fuel sample to each plane captain prior to fuel delivery. When the plane captain has agreed that the fuel sample is clear of contamination, and is of the proper color, the fuel delivery is concluded.

NAS Alameda is alert to the problems associated with guaranteed delivery of the proper fuel. But, it is hoped that operating personnel throughout the Navy will appreciate that they, the users, also play a big and important part in this system of checks, and double checks.

E. L. FARRINGTON, CAPT
CO, NAS Alameda

● It is hoped that your letter will prove thought-provoking, as well as helpful in preventing future accidents of this type. At least it will serve to keep the subject before fleet and shore personnel charged with the responsibility of dispensing aviation fuel.

So What Else Is New?

Sir:

It was noted in the 12 Nov 1960 issue of Navy Times that the specifications for a new helicopter Water Rescue Basket had been submitted to your organization by Marine Corps Air Station, El Toro, Calif.

A remarkably similar device has been used by the Coast Guard for the past five years. A photograph of the Coast Guard device is submitted for comparison. Since Elizabeth City is such a short distance from Norfolk, it is suggested that a representative of the Aviation Safety Center visit this command if further evaluation of the helicopter rescue basket is desired. Many of our pilots and crewmembers have had valuable experience with this device.

A. E. HARNED, CAPT, USCG
CO, USCG Air Station
Elizabeth City, N. C.

● The water rescue basket referred to should have borne a strong resemblance to the one used by your organization—it was built from U.S. Coast Guard Aircraft Repair and Supply Base, Elizabeth City drawing 68-1-6 of 2 December 1952. It is indeed surprising that you were not credited with the development.

Ancient Directives Cause Confusion

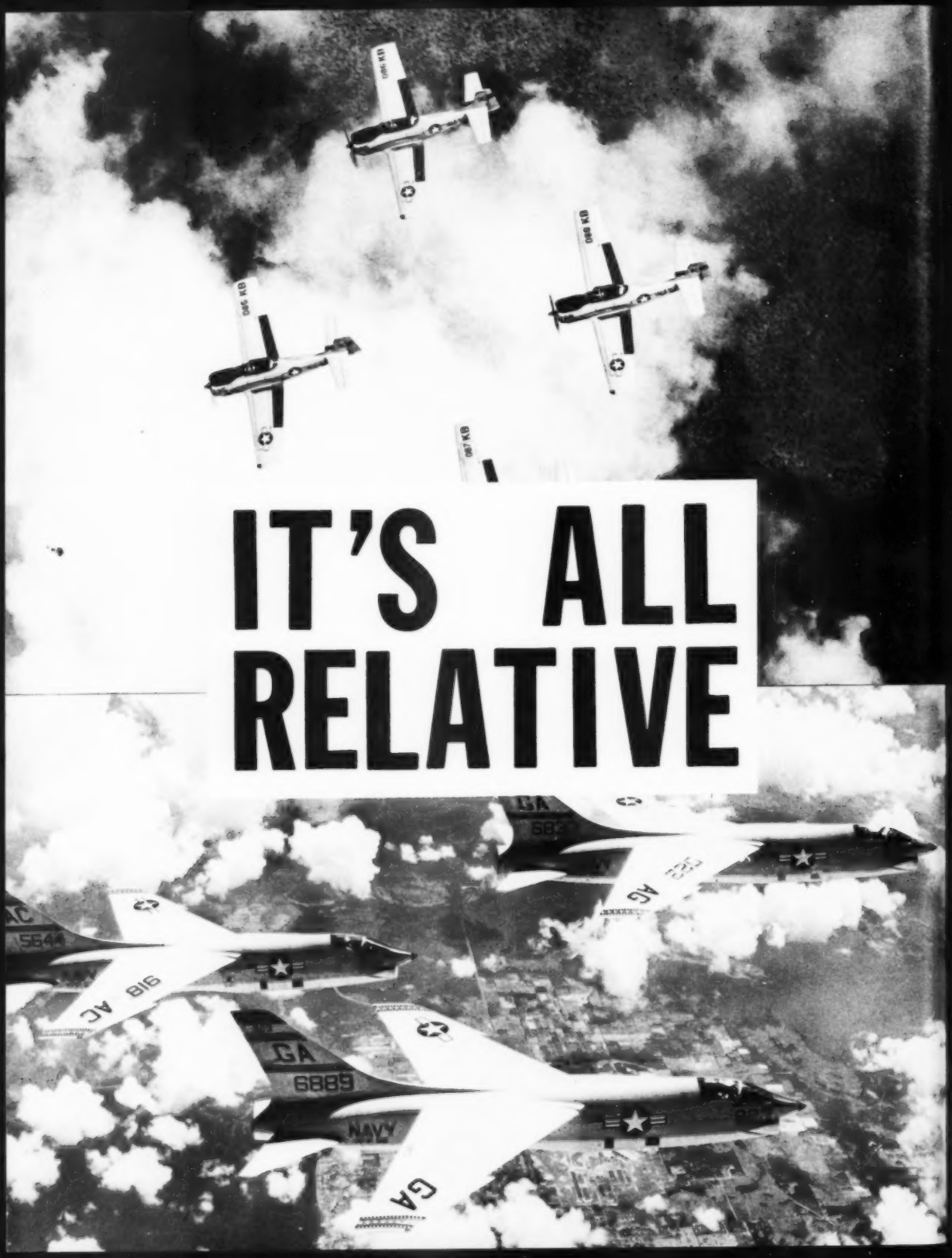
Sir:

Re: the letter by M/Sgt. C. T. Perkins (November 1960 APPROACH) concerning a single compass manual. I'm sure that almost anyone concerned with compass swinging shares his viewpoint. Volumes could be and no doubt have been written on why there isn't a single manual covering the rudiments of compass swinging. There always seem to be conflictions in printed matter on this subject.

Recently in this activity, we discovered a couple of words in the A4D Handbook of Maintenance Instructions concerning compass compensation. The statement was that system compensation must be accomplished in accordance with Specification MIL-C-7834. We ordered said MIL Specification and, after the redness disappeared from our faces upon seeing how long this publication has been effective (18 February 1952), we discovered that we have had a very comprehensive manual available all this time. While this MIL Specification may not be all inclusive in all phases of compass swinging, it is "the word" approved by the Army, Navy, and the Air Force, and the best we have to date.

J. B. LONG, AEC
Quality Control CPO
VA-123, FPO, San Francisco

● The lack of cross-references to older, but pertinent directives appears to have induced confusion to compass calibrating problems (Headmouse p34 Sept 60 APPROACH). Accordingly, NASC has recommended to BuWeps that AIB 29-46 be revised and brought up to date. ●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A refresher course in the fundamentals of the fine art of formation flying. A good formation is truly a thing of beauty and a source of satisfaction.

by LCDR George R. Carlson

SOMETIME ago the CNO Safety Council noted that "mid-air collisions have doubled in frequency. In all but one, these involved aircraft in the same flight. In each case non-adherence to, or lack of well-defined squadron doctrine, was the basic reason for the collisions."

While this discussion is written primarily as a refresher for ex-staff or desk types—any one who has not flown formation recently—it also is available as possible fodder for squadron doctrine. While hardly the last word on the subject, and possibly controversial in spots, its purpose will be served if only to provoke further discussion. If the material sounds familiar, you were probably exposed to it in basic training. It worked beautifully in the SNJ and T-28 and applies nicely to the T-34, AD, F9F-8, and P2V-7 so it should be applicable to some degree in most other present day aircraft.

Relative Motion

The essence of formation flying is, of course, relative motion. It can be helpful to think of the relative motion as it resolves in each of the three dimensions. Keep in mind that the leader (or aircraft being flown on) is considered as being stationary, and any apparent relative motion is your own. When dropping behind in bearing, throttle will help return you to position; when overrunning, a reduction of power will move you back (speed brakes or sometimes bomb-bay doors can help here). If below your position, a little back pressure should do it; when above, ease the nose down. Too wide, the gentlest turn (not skid) toward your position; too close, ease it out. This is all painfully obvious, but is significant when considering the inter-relationship of the corrections. Adding power to pull ahead will also cause the aircraft to climb and decrease stepdown unless accompanied by forward pressure. Conversely, a power reduction not accompanied by some back pressure will result in dropping back and down. Back pressure by itself will reduce stepdown, but will also reduce airspeed and tend to increase nose-to-tail distance. Increasing stepdown without changing power will cause a tendency to pull ahead. This overlap of corrections is a very real and practical consideration.

As in all phases of flying good basic airwork is essential—smooth deliberate corrections and the maintenance of balanced flight. Good airwork and the ability to detect relative movement early are probably the two basic elements for successful formation flying. Recognizing relative motion in its early stages necessitates correspondingly small corrections, which when applied promptly and gently make for good stationkeeping. As in instrument flying late corrections tend to become excessive, leading to overcorrecting. This can be worse than no correction at all; it results in making the job more difficult for yourself and others in a large formation.

The Wing Position

The wing position discussed here is for a parade-type formation where a specific position will be maintained with the assistance of throttle changes. Most activities have a parade wing position established. In the absence of one a good wing position can be determined by scaled diagrams, simple geometry, measuring, and a little in-flight experimentation.

Continued

Power changes are more dependent upon the leader's rate of roll than the amount of bank.

A good wing position is usually established on a specific bearing near the quarter with a comfortable amount of stepdown, and at a distance that provides adequate lateral and fore-and-aft clearances. Several convenient gouges or checkpoints are desirable. Checkpoints are helpful mainly in the determination of bearing and stepdown. However they should not be relied upon exclusively—only the eyeball can provide distances and rates of relative motion.

It can be helpful in maintaining position to think in terms of keeping the aircraft parallel to the leader at a desired lateral distance, making small, timely corrections to maintain bearing and stepdown.

It also is helpful to think of a parade formation as a single plane made up of the planes in the formation flying as one unit.

Turns

Virtually everything that can be said of relative motion and level flight is applicable to turns. However there are several additional considerations worth mentioning. For parade the leader must "lead" into rolls by easing into and out of rolls, i.e., make a gentle acceleration smoothly into an even roll rate, hold, then slow and ease the roll at the same rate it was entered.

Normally, the aircraft on the inside of a turn will rotate about the leader's longitudinal axis, maintaining the same relative position and picture as in level flight. In so doing a reduction in airspeed is necessary to prevent overrunning. This is due to flying about the circumference of a smaller circle than the leader, and is aggravated by the fact that some altitude must be lost in the process of rolling about the leader's axis. The amount of power reduction necessary to effect the speed and altitude change is dependent more upon the leader's rate of roll than the amount of bank. The slower the rate of roll the easier it is for the wingman, in that more time is provided for the speed and power changes. An excessively slow rate of roll is not normally desirable nor practicable except in large parade formations. It is more important that the leader roll at a uniform rate in order to avoid "faking out" his wingman. In addition to changing power the wingman should roll with the leader, adjusting his rate of roll to maintain the correct lateral separation.

Once established in the turn it's a simple matter of flying the angle of bank necessary to remain parallel to the leader, making the same neat corrections as in level flight. Rolling out will require enough power to compensate for the speed change and slight climb necessary to maintain position on the leader.

On the outside of a turn, aircraft will roll about their own longitudinal axes (exceptions: formation instruments or acrobatics). This presents a different view of the leader's aircraft. Step-down can be determined by keeping the leader the same distance above the horizon as in level flight. For a bearing gouge the level flight checkpoints can usually be lined up with each other vertically. To stay on the desired bearing will require additional power during the roll-in due to a larger radius of turn than the leader's. There's a tendency to lose step-down on a roll-in due to wingmen permitting their aircraft to climb when the power is applied to stay with the leader. Here again, just stay parallel with the leader and baby it all the way around to stay in position. Start easing off the power as soon as the leader starts his roll-out. A considerate rate of roll by the leader is less likely to embarrass his wingman, particularly in large formations.

The power requirements rolling in and out of turns are transitory—power needs should not be abnormal once the necessary speed changes have been effected.

The Crossunder

The crossunder is sometimes a source of difficulty for pilots and has resulted in a number of mid-air collisions. It can be executed in a boxed or curved pattern. In either case the critical considerations are nose-to-tail clearance and rate of crossing. The nose-to-tail clearance should remain constant. It will normally be the same as in the wing position. Either type of crossunder usually requires extra step-down when passing aft of the leader.

When executing the crossunder the wingman should insure that he is in position with the desired nose-to-tail clearance. The step-down may be increased initially, or during the lateral travel in the curved type of crossunder. Rather than "turning" to the other side, which results in excessive crossing rates, or skidding across, it's been found to be quite effective to make the smallest possible heading change—roll in, roll out—letting the heading differential take care of crossing. This should result in a nice comfortable rate of travel. Some pilots state that just thinking about crossing is enough—it doesn't take much.

As the aircraft moves across increased throttle is usually needed to maintain nose-to-tail distance. This can be explained by the resultant vector of the forward and lateral travel during the crossunder. The taking of additional step-down tends to initially compensate for this, making the need for added throttle not readily apparent.

Sometimes, particularly in a tight formation, the crossing aircraft will tend to hang up just after passing behind the leader. This results from the leader's down-wash on your wing opposite to the direction of travel. In this case, just give it a little more to keeping crossing to the desired position.

The Rendezvous

In airplanes as well as ships, a collision situation exists when two objects are closing and maintaining constant relative bearings. Other than in a running rendezvous where speed differentials are utilized, this is the principle applied in getting a formation together.

Given a closing situation a rendezvous could be effected by either maintaining a constant relative bearing from yourself to the leader, or by remaining on a constant bearing *from* the leader. In the former, while ultimately arriving at the same spot as the leader, there is no control over the direction from which you'll approach him. Whereas when working in relation to a relative bearing from the leader, once abaft of his wing, join-up is virtually assured, and in a comfortable sector.

Assuming two aircraft at the same speed and altitude with the leader in a moderately banked turn, the wingman should position himself to the inside of the leader's turn and maneuver to arrive on the rendezvous bearing or sector from the leader. If working in relation to a single bear-

If the rate of closure is readily apparent from a distance, the chances are that it is excessive.

ing from the leader, approximately 135 degrees or 225 degrees relative should be good. A sector of 15 degrees or 20 degrees either side of a bearing can be used. In either method the more acute or nearer the beam, the greater the rate of closure, with the converse holding true.

In the case of too slow a rate of closure, a more acute bearing can be gained by steepening the bank and cutting further to the inside of the leader's turn. An excessive closing rate can be alleviated by shallowing bank to drop back on bearing, and augmented if severe, by a power reduction and the use of speedbrakes. If the rate of closure is readily apparent from a distance the chances are that it's excessive.

The practice of shallowing the angle of bank to reduce the closing rate earlier in the rendezvous seems inconsistent at a glance with the necessity for steepening bank to stop in position on a fast join-up. In the latter case the problem is likened to a crossunder where an excessive heading differential is present—wrapping it up is necessary in such a case to become parallel to the leader. This is not meant to counter the cardinal rule of not throwing up a wing on join-up.

This bearing-from-the-leader technique is foolproof for getting into the ball park. However, it can complicate the rendezvous in the final stage if a slight speed differential exists. Try this: the last 100 yards or so, forget about a rendezvous, as such, and just fly the airplane into position—don't forget to arrive with step-down.

More squadrons require that a joining aircraft stop or hesitate inside the leader, abeam of the desired position before crossing. Oftentimes, following an otherwise good join-up, the wingman will be left behind while crossing. This is a result of insufficient power (airspeed) to allow for the crossunder, aggravated by crossing from a position inside of the leader's turn to one outside.

Free Cruising

The free cruising technique is a means of flying in relation to the leader, not necessarily in a fixed position, with a minimum of power changes.

Formation techniques which work well in the AD . . .

. . . are applicable to some degree in all aircraft.

The principle of flying on the leader by varying angles of bank (turn radii) has applications in the rendezvous, tail chase and fighter tactics. The method is dependent upon the leader's turning; it provides a formation with greater maneuverability and is a fuel saver.

Free cruising, due to the freedom of movement, necessitates more step-down and nose-to-tail clearance than parade. In level flight power changes are necessary to maintain these distances. Upon rolling into a turn the wingman must adjust his rate of roll, not to match the leader's, but to maintain nose-to-tail distance while moving toward the leader's radius of turn. If power is not already set to match the leader's, an approximation should be made and, if nearly correct, a fixed distance will be maintained from the leader on or near his radius of turn. The leader's radius of turn will be matched when flying in the same vertical plane rather than in relation to his vertical axis. Once established on his radius with matched power, distance from the leader will be maintained by matching his angles of bank and rates of roll. If dropping behind, increase control pressures—when overrunning, relax them. This technique requires greater control pressures than parade due to the effect of the leader's downwash.

Signals

Due to the variances in aircraft and missions no attempt will be made to cover specific signals. This is an area that should be covered explicitly by doctrine. Signals should be clear, readily understood and repeated or acknowledged in the same manner by all members of a flight. Some signals are more or less optional such as the head nod for turns, or an execute signal for certain evolutions.

The Lead Change

The lead change has been a source of embarrassment on occasion—both as a result of improper execution, and due to confusion as to whether a lead change has transpired. It's hard to say which is worse, a wingman that won't let go of leader to take the lead, or two aircraft in proximity, flying independently. This points up the need for good signals, particularly on the lead change.

Prior to passing the lead the leader must assure that the area ahead is clear of other aircraft, clouds, or rocks. The lead is usually passed by the leader's patting his hat and pointing to his wingman. Prior to accepting the lead by patting and pointing to himself, the wingman should insure that he is in position and ready to go.

Upon receipt of the lead the new leader must

look away from the man that he relieved and go about the business of taking care of his flight. This includes setting the power if not already done. In contrast with his former wingman the old leader must, without taking his eyes from the new leader, increase wingtip distance, reduce power to take step-down and drop back to the bearing for wing position or a crossunder.

Never lose sight of the aircraft ahead of you—have the arrangement of the formation in mind at all times.

The Leader

A prime requisite for a good flight leader is thoughtfulness. Some of the more basic considerations include: a minimum of power changes, especially those without warning; balanced flight; constant rates of roll and angles of bank; good and timely signals and above all smoothness. These considerations are applicable to the section and seem to vary directly with the square of the number of aircraft in a flight. Of course these are far from the only considerations. Those not listed should be no problem as long as the leader does not lose sight of his formation's "inner needs."

Large Formations

Most of what has been said is applicable to large formations. Formation flying is the epitome of teamwork—the larger the formation the more essential it is that each member do his job well.

Flying wing in the midst of a formation should be something of a compromise—while maintaining one's own position, it should be done in such a manner as to make yourself as easy as possible to fly on.

On join-ups, fly in relation to the lead aircraft

until it looks right to begin joining on the plane ahead.

Don't forget another cardinal rule: never lose sight of the aircraft ahead of you—have the arrangement of the formation in mind at all times.

A good formation makes an effective fighting team—it can be a thing of beauty and the source of considerable satisfaction. Give it the attention that it deserves.

From NASC Files

The fact that mid-air collisions still occur because of violations of the basic precepts of formation flying is aptly illustrated by a recent mid-air collision of two AD-6 aircraft.

Three AD-6s had been engaged in formation tactics when the leader elected to practice the defensive break maneuver. After the first unsuccessful maneuver the leader informed the wingmen that the next break would be to the right. As he was completing his rollout he felt a collision aft of the cockpit. Both pilots made successful bailouts.

In analyzing the accident it was determined that the No. 3 man lost sight of the No. 2 in performing the defensive break to the right. He wasn't too concerned about this since the leader had imposed a center line restriction on the maneuvering of both wingmen, i.e., neither pilot was to exceed the hypothetical line extending aft of the leader's aircraft. The chief contributory factor in this collision was the No. 3 man's failure to keep all aircraft in the formation ahead of him in sight. Had he initiated some remedial action upon losing sight of the No. 2 aircraft, he never would have collided with the leader.

In his endorsement the commanding officer stated "This accident clearly demonstrates the need for stressing fundamentals in any flight program. *Even something as basic as the necessity for keeping sight of all airplanes ahead in a formation should not be taken for granted.* The lesson learned in that regard has been plain and has resulted in careful review of present doctrine and flight briefing procedures . . . ." ●

Good airwork and the ability to detect relative motion early are the two basic elements in successful flying.

LCDR George R. Carlson is presently attached to VP-31, the West Coast VP RAG squadron. After receiving his wings in 1950 he did a tour of duty in VP-931 (later VP-57) prior to arriving at Pensacola for instructor duty. While attached to the Instructor's Basic Training Unit he was the Technical Advisor for the T-28 formation training film "Fundamentals of Section Tactics and Division Tactics." Subsequent assignments included duty on the USS HANCOCK as Flight Deck Officer followed by his recently completed tour with VP-19 as Safety Officer and PPC in P2Vs. LCDR Carlson is a graduate of JTTU and the University of Southern California Safety Officers Course.

AFTER a month at sea in the North Atlantic, where all pilots got a taste of driving around in the low low thick stuff, followed by a fine week in port, we felt ready for anything on the trip home. Scheduled launch was four ADs plus a test hop, VFR only. No jets were scheduled. At brief time, around 0700, the weather outlook was pessimistic. The duty meteorologist allowed that the weather was bad now, 300- to 400-foot ceilings and 1- to 3-mile visibility, and getting worse, down to 0 - 0 by noon when the warm front going east and the ship going west should part company.

We were ready for anything but at that time we were ready to get cancelled out. We practiced standing by in the ready-room for less than half an hour when simultaneous word arrived from AirOps and the weather man, "The front has passed! It's CA—and almost—VU on the flight deck. Launch 'em!!" Temp/dew point spread was still around 1° but we went. Although we had to reverse course shortly after takeoff to avoid a fog bank, we did not seriously question the weather picture until we got to 8000 feet. If the warm front had really passed, it had an awful big brother close behind.

The hop proceeded as briefed. Our four-plane division broke up and we played CAP for the ship, while the test hop remained over the ship's Tacan. After an hour and a half we were over a solid overcast at 5000 feet and the ship sounded concerned. Did we have a hole in sight big enough to recover in? At one point we did, at about 25 miles on the reciprocal of the ship's course. The ship rogered and advised that

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in ready-rooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

our hole was not conveniently enroute to Florida.

We were ready, as before, for anything, and we could count on CCA to get us down. After simulating Mach 2 interceptors for two hours we were advised to conserve. At this time we were all on internal fuel, with 4 + 00 hrs. remaining. We were cleared to return to the ship and commence an approach on arrival. CCA was normal except that at 300-foot CCA minimums, we were still in thick gooey fog. We were advised that if we let down a little farther we might break out.

One pilot did. LSO made contact with him like "Wave off right!!" We all got a chuckle

out of the mild note of hysteria (afterwards that is). Our boy had broken out of the goo all right, eyeball to eyeball with the island.

Our buddies down in the dark room with the lighted ouija boards decided to call it quits on CCA. We were still ready for anything. Our divert field on the coast of Spain was equipped with a 4000-foot runway, lots of facilities including a radio beacon (but no UHF) and we even knew its elevation, 807 feet above sea level. With only 300 miles to go and 3 hours fuel remaining after the approaches, why worry, especially with the field reporting nothing but 8000′ thin scattered.

The flight joined at 500 on-top and we were on our way. The radio beacon serving our destination turned out to be, in small print, "on request only," but another beacon only 15 miles away was loud and clear on the bird-dog. We had to climb to remain on-top. Two and a half hours later, when we got station passage (headwinds on the way), we were at 12,000 feet in and out of the tall stuff. Things didn't look too good but we were still ready.

Just on principle we switched to guard and emergency IFF in case someone might be looking for us. Our beacon was located on the coast and we let down over water to the west, dividing into two and three plane sections. The first section got a glimpse of the beach from 6000 feet and let down in the clear in a spiral. The second section never broke out and was still in the stuff over water at 200 feet

on the radio altimeter. Weather along the beach was fine, 800 to 1000 feet with visibility restricted only in patchy rain showers. The first section advised the other three aircraft to head east and then headed for the area where the field was supposed to be.

We were embarrassed by the lack of appropriate maps. Although our map cases were packed with ONCs, this particular area had not been anticipated, and our only clue as the field's geographic location was the outline profile of the coast as depicted in the RadFacs. The first section flew up what looked, in the RadFacs, like the right bay, surrounded by hills that went up

into the 800- to 1000-foot overcast. With field elevation at 800 feet, things didn't look too rosy. The bay ended in a circular lagoon, big enough for a comfortable orbit and just right for a nice five-plane ditching. It was calm and sheltered, with freighters anchored in the deep water in the middle.

While awaiting the arrival of the second section, the first section pondered what to do. We were throttled back so far you could read the Aeroproducts label on the prop blades, but even at max endurance we only had about 45 minutes remaining. Even at altitude we couldn't have made another field. Now we were really ready. One or

two valleys leading out of our lagoon looked like they might lead to the field; only trouble was that they were full of rainshowers. Time passed. The second section arrived and set up an orbit down the bay. The test hop (VFR only) was in bad shape for fuel.

At the time I was more concerned with the prospects of having to prepare the accident reports on a five-plane ditching, which staggers the imagination, than I was with the personal dangers involved in ditching.

First section had now split up and was probing the weather.

Finally, a slight lifting of the stuff allowed one aircraft to fly up the most likely looking valley by remaining as high as possible near the side of the bordering ridge, to permit a safe turn into the valley in case contact with the ground was lost. This technique (not recommended) allowed penetration close to the crest of the hill into a relatively clear area, about 400 feet broken above the terrain.

The runway was visible off the port wing. It was completely obscured at one end by a rainshower and it was glistening with water, but it looked beautiful. A downwind landing was made due to the rainshower at the other end of the runway and detailed instructions were then passed to the other four aircraft on how to find the field.

Ten minutes later, after some milling around, the next AD popped out of the goo, followed by the others at 3 and 4 minute intervals. After 6 + 45 hrs. airborne, we even had enough gas to taxi to the parking area.

We got the best of receptions by the Spanish, who received advance notice of our arrival two hours after we arrived. On the following day we had an uneventful 580-mile hop out to the ship although we flew on-top of 400 miles of warm front on the way.

The only moral we have is that it's better to carry too many maps than to be caught without the one you need, although no amount of maps will blow the clouds away. And, of course, when they decide to launch aircraft you might as well be ready for anything because anything is what you're likely to get. ●

HEADMOUSE

Have you a question? Send it to Headmouse, U.S. Naval Aviation Safety Center, Norfolk 11, Virginia. He'll do his best to help.

No Substitutes

Dear Headmouse:

I submit the following as a short-cut to mae west preflighting:

In preflighting mae west CO_2 bottles, I have found that it is not necessary to remove the bottles from their holders in order to inspect for discharge. A very light tug at the lanyards will be met by either a definite resistance, indicating a good bottle, or no resistance at all, indicating a punctured seal. It is then only necessary to ascertain that the cartridge caps are tight, and the preflight is complete.

ANYMOUSE

► Sorry, we can't buy this method. BACSEB 22-58A, 4b.-(b) states: "Inspect to insure that discharge levers are safetied in place against the holder by means of safety (shear) wire." The "definite resistance" you refer to should be that shear-wire. If, through oversight or ignorance of the requirement, your CO_2 cylinder toggles have *not* been shearwired and you tug the toggles, even lightly, before each flight, you will eventually puncture the CO_2 cartridges.

Very resp'y,

Headmouse

Hydraulic O-Ring Packing

Dear Headmouse:

APPROACH December 1960 refers to an incident relating to two hydraulic seals in the same groove.

Military Specification Mil-P-5514B (ASG) of 30 Jan 1956 states "*3.4.7 Number of O-rings per Gland.* The use of two or more O-rings in the same groove or in adjacent grooves can produce pressure traps between the seals, particularly when hydraulic fluids or pneumatic seal lubricant is trapped between the adjacent O-rings and a subsequent rise in temperature takes place causing thermal expansion of the fluid or lubricant. Such conditions have caused jamming of units in service. If the use of two or more O-rings are required for some design reason adequate provision such as venting of the space between the O-rings must be made to prevent pressure trap."

An example of this design feature can be found in most piston type hydraulic accumulators. There are two O-rings on the piston and there is a small hole drilled venting the space between them in accordance with the Mil Spec.

I suggest that the above be given wide dissemination as I have run into this problem before and it is hard to pinpoint the culprit that does it.

November 1957 issue of APPROACH contained an article on "What is a hydraulic leak." I sure would like to see this article reprinted for the benefit of all hands and all new men in naval aviation.

ROBERT K. WEST, AMC
Beeville, Texas

► An updated reprint is scheduled for a future issue.

Very resp'y,

Headmouse

Safety Officer Utilization

Dear Headmouse:

Since the issue has been raised I believe the USC trained ASO should have something to say on the subject of Safety Officer's utilization. One major question is apparent in the utilization issue appearing in the January publication of the APPROACH namely; "Is a safety officer always a safety officer?"

Take for example the school trained safety officer who has just finished two years in the squadron safety billet. He then reports to an organization which does not have a school trained officer assigned as ASO. Now the question arises whether or not our qualified officer will be required to serve another two years in the same position. The policy as advocated in the utilization article states that he must be assigned as safety officer and perhaps to the disadvantage of the officer and unit concerned.

It is this officer's opinion that the intent of OpNav Inst 3750.14 does not remove the commanding officer's prerogative for assigning the best men in the most responsible positions. This includes the safety officer's assignment to other unit billets which provide a well balanced departmental knowledge necessary for command.

A similar philosophy can be seen in the assignment of personnel attending the Aviation Maintenance Officer's Course at Memphis. Most commands require the officer to be assigned to the maintenance department a minimum of one year after completion of his formal training. This does not mean he will be a maintenance officer in each succeeding squadron, in fact the sacrifice of other departmental training for maintenance only is not condoned.

The emphasis of safety above all other departments is commendable but the policy advocated by the previously referenced article leaves one major question unanswered.

My views as presented are not necessarily singular but can be supported by many of our formerly trained USC graduates.

APPREHENSIVE SAFETY OFFICER

► It is the intent that in the main all graduates of USC will be utilized in a safety officer billet during their first tour after graduation from that training. However, it is not the intent of the Navy that the individual be stamped "for safety assignment only" in subsequent tours.

Very resp'y,

Headmouse

Continued

R4D Load Limits

Dear Headmouse:

How many more R4D-8s are we going to splatter in the end zone before someone comes out with some realistic max gross takeoff weight data on the aircraft?

After witnessing one in Naples almost a year ago from which I helped scoop out the fatalities and injured, ComNavAirLant came out and put the limitation at 33,000 lbs. Some activities are *still* operating them at 36,000 lbs.

How about getting BuWeps to put out some realistic weight restrictions on the aircraft taking into account runway temp., slope, etc.

CDR, USN

► Weights are left up to the operating command except in the case of AirLant squadrons. The Pilots Flight Manual says 36,500 lbs. but further states that FHA approved only 31,500 lbs. NASC recommended 32,000 to BuWeps and ComAirLant settled for 33,000.

Very resp'y,

Headmouse

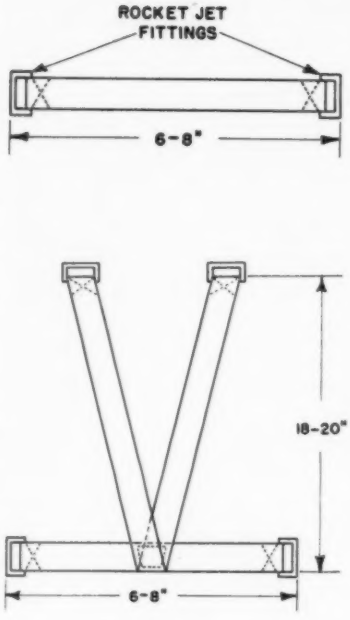
Harness Need

Sir:

Since the incorporation of the M-5 Martin-Baker seat in the F3H-2 with the associated torso harness for pilots the aircraft is without a seat belt and should have a harness for use by plane captains and maintenance personnel when the aircraft is being moved. This is a particularly dangerous situation at sea where aircraft with plane captains aboard have been lost over the side on several occasions.

This problem is just rearing its ugly head in this squadron but limited investigation for a fix in use by A4D and F8U squadrons indicates the problem hasn't been considered and nothing has been done about it to date.

An interim measure has been taken by this command to fabricate a nylon webbing strap equipped with female rocket jet fittings on each end to enable plane captains



to use the existing lap belt. It is strongly recommended that the Safety Center look into this problem and instigate development and procurement of a "spider" harness of some sort which will enable plane captains to also be able to use the shoulder harness which would increase their chance of survival in an inadvertent dunking.

L. T. WARD, CDR

CO, VF-41

► NASC is fully in accord with your recommendation that plane captains be provided some protection from loss over-the-side. While NASC is not in the Research and Development business it is forwarding your suggestion to the appropriate BuWeps authority for consideration. Meanwhile APPROACH passes on the interim fix for evaluation by others who may be interested.

Very resp'y,

Headmouse

For Standard Licensing

Dear Headmouse:

Refer the article "Round Up and Repair," June '60. That three-photo spread of junked ground support equipment is repeated every day and everywhere. I am particularly concerned with yellow equipment — tow tractors, high pressure air compressors, hydraulic jennies, pre-oilers/preservers . . . The problem: Qualification of the operator. How does one determine the qualifications of an operator when there is no standard yardstick to measure a man's qualifications. The exception is CNAP requirements for NC-5 operators. Some outfits license an operator but the next base he goes to will not honor his license. So he has to go to school for a week learning what he already knows. I'm for giving a *standard* test, both written and demonstrative, to qualify operators and the issuance of license then which will be honored throughout the Navy.

GSE TYPE

Navy 520
FPO San Francisco

► Your gripe is pretty much in line with FY 60 findings of the Office of the Inspector General which reports that at most stations misuse of aircraft ground support (yellow) equipment was observed to be:

- Operated by unqualified personnel
- Used in lieu of regular transportation equipment
- Driven too fast
- Improperly positioned when servicing aircraft

The Inspector General recommended to BuWeps the establishment of Standing Operating Procedures and safety precautions for operation of ground support equipment in Flight Line servicing, stating further, that such would provide a "sound and needed" basis for training and indoctrinating personnel.

Latest word is that NATechTraCom, NAS Memphis has set up a program for training yellow equipment operators.

Very resp'y,

Headmouse

UNAUTHORIZED MANEUVER

UPON completion of a basic instrument hop while en route back to the field the instructor arbitrarily decided to demonstrate a vertical recovery to the student. After one successful recovery the F9F-8T was pulled up to the 70-degree nose-high attitude at 25,000 feet and the airspeed was allowed to decrease to approximately zero indicated. The aircraft snap-rolled right-wing-down and started into a spin. The instructor checked his instruments and put in right rudder. Power was retarded and the stick held in the aft position. Power was applied to various settings but none of these corrections had any apparent effect on the spin. At 10,000 feet both pilots ejected receiving minor injury.

In analyzing the accident the board concluded that the pilot failed to recover from the spin due to improper analysis. Contrary to published procedures he attempted to determine which rudder to apply by referring to the ball in the turn and bank indicator, rather than determining the direction of the spin by reference to the needle.

The spin which originally commenced as an upright spin developed into an inverted spin. Because of the instructor's incorrect analysis of spin direction he applied pro-spin vice anti-spin control and thus aggravated it rather than stopping it.

One endorsement stated "The primary cause of this accident was the unauthorized and unnecessary execution of a non-standard flight maneuver . . . This accident clearly illustrates the fact that syllabus standardization makes a direct contribution to aviation safety by assuring that only those maneuvers that are aerodynamically sound and fully understood are included in each phase of the syllabus. It is an example of one of the possible consequences of unnecessary deviation from a well-conceived and carefully prescribed flight syllabus."

Please turn page.

Don't Hesitate—WAVE OFF!

THE modern jet jockey has learned one basic rule better than all others and that is to watch out for the backside of the power curve. He knows that any increase in angle of attack at speeds below L over D Max will cause a geometric rise in induced drag and a corresponding increase in thrust required to remain airborne. In other words, he isn't going to pull back his angle of attack the last few seconds before touchdown without a substantial increase in power.

There is one small item that may have escaped his attention though while his head was being crammed with aerodynamics. You do not have to pull back on the stick to increase the angle of attack. You merely have to reduce power. Suppose a carrier pilot has set up a 4-degree glide slope at a relative speed with the ship of about 100 knots. He has one angle of attack. It soon becomes evident to him that his glide slope is less than 4 degrees as the meatball starts to climb. Without moving the stick, he decreases power slightly and the meatball starts down. He has increased his angle of attack by increasing his glide slope which results from a decrease in power. If he pulled off too much power the meatball goes low because he has less than the power required to maintain a 4-degree glide slope. About this time our pilot is 200 yards astern and sinking. At 100 knots relative speed he is closing with the ship at a rate of 169 feet per second. He has 3½ seconds before crossing the rounddown. Allowing one second to make a decision (lightning calculation), another second to respond, a waveoff is attempted. While the engine is winding up to provide enough thrust to stop the descent and climb out of trouble (another 2 to 3 seconds) our pilot realizes he has run out of time. With the deck coming up rapidly due to excessive sink rate and with the throttle stop-cocked, despite his knowledge to the contrary, he pulls back on the stick to cushion the impact. When all the stops are pulled out, instinct alone will tell the pilot to fly away from danger. If the choice is hold stick and crash or back stick and crash, there is little doubt where the stick will go in spite of knowledge of aerody-

L. S. O. Confucius say: "'Tis better to bolt, than to dive."

namics or a lot of experience. After he gets into trouble there is no way out.

The trick is to *not* get into the situation. Pilots who have managed to survive deck crashes make similar statements:

1. "I knew better than to change my angle of attack, so I held what I had down to the deck." (His angle of attack was increasing as his sink rate increased through lack of power.)

   CO's Endorsement: " . . .all pilots will be briefed not to try to flare but to hold what they have."

2. "I was surprised by the force of impact for the conditions I had." (He took off too much power on a high meatball and held his altitude, thus increasing his angle of attack and sink rate.)

   CO's Endorsement: ". . . this was definitely material failure as the landing was 'firm' but not 'solid'."

3. "I was a little high at the ramp so eased the nose over slightly and did not try to flare."

   CO's Endorsement: " . . . his attitude was normal on touchdown. Previous hard landings could have weakened the landing gear." (You could hit in a normal attitude with a 45-degree glide slope.)

There is a point in every final approach where the pilot is committed to touchdown whether he wants to or not. This will vary with model aircraft, but for all intents and purposes it is the same for high-performance jets. This is a point beyond which the application of full throttle will not get the airplane out of trouble. The only catch is that this point is determined by entry into the glide slope, relative airspeed, power, angle of attack, and sink rate. With all these variables there is no fixed point as it will range from the deck to about 300 yards out on the approach.

The squadrons should make it SOP that power will not go below a standard minimum setting on any approach (in the neighborhood of 85 percent) and set the point of no return at at least 250 yards. If the pilot finds himself making radical corrections at this range, he should take a waveoff. If he feels he is not just right and must make some corrections after passing this range, he should wave off. He only has 4.5 seconds to the ramp and last second corrections cause crashes.

The early waveoff will do two things. First, it will reduce the chances of an accident. Second, it will force the pilot to get lined up better and earlier to keep from getting one. (Plus you get more flight time than your buddy.) — *1st MAW "Wingtips"*

A3D Bolter

A RECENT incident which occurred to an A3D pilot operating aboard a Sixth Fleet carrier terminated in a successful diversionary landing instead of a night ditching. The pilot had made a normal night mirror approach engaging the no. 2 pendant. Unfortunately after 121 feet of runout the purchase cable pulled loose thereby releasing the A3D. In accordance with squadron doctrine the pilot had applied full power and retracted the speed brakes upon hitting the deck. As the A3D again gained momentum and dropped off the angle the landing gear was retracted. Momentary contact was made with the water in a slightly wing down flat attitude, then the A3D became fully airborne. The crew was then diverted to the Azores without further incident. Due to the pilot's alertness and outstanding airmanship the aircraft sustained only minor damage and a possible tragedy was averted.

Inspection after the incident showed that the purchase cable parted because of a crack in the tack weld that secured the anchor terminal to the barrel at the anchor end of the purchase cable.

This incident is *positive proof that the procedure of immediate full power application and retraction of speed brakes after touchdown should continue to be A3D standing operating procedure.*

Eventually, a bad connection will be made between

een a regulator and a mask – this is the beginning of a

CLOSE CALL!

THE A4D-2 cruising at 33 to 35,000 feet . . . CAVU day . . . I was 9-2, the chase plane on an instrument training flight for 9-1.

"9-1, you are clear."

I could see no other aircraft. I should close it up a bit, I thought. 9-1 is turning, better close it up a little more. Got to put more heat to the canopy; it's still a little foggy. Air full ON, heat UP. Fogged canopy isn't clearing. Better wipe a spot clear . . . It won't wipe off! . . . Oxygen?

Scanning the instrument panel, I noticed the oxygen down to one liter, the needle dropping slowly. My first reaction was to lose altitude before I ran out of oxygen. Cabin altimeter appeared to be 21,000. I called 9-1 and told him to get his head out of the cockpit and descend to 10,000 because I was losing my oxygen. I tried to follow him down but it was turning into too much of a chase so I broke off and let down on my own. Later, I found that 9-1 thought he was to follow me down.

On the way down, another squadron aircraft said, "9-2, this is 7-2. Check your oxygen mask." Well, I had news for him . . . I was checking but finding nothing wrong!

At 10,000, the canopy finally cleared and I checked the oxygen hoses from the console to the mask. Everything looked OK and felt OK. I noticed it was very easy to breathe so I shut the oxygen off. I could still breathe! I looked in the mirror and then I saw the connection between the mini-regulator and my oxygen mask was broken. I could not feel the break with my flight gloves on.

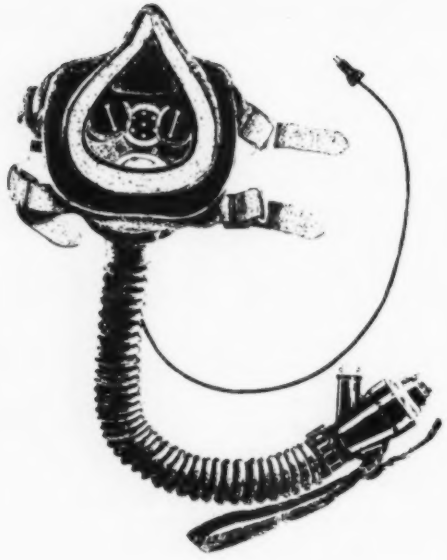
At 10,000, I was doing OK so I sent 9-1 back up to do some air work and then return via a TACAN approach. Obviously, I was still a bit punchy.

In about five minutes, while heading home, I started to get a headache so I switched to ram air and began to feel better. I flew over home base at 7 to 8000 for about 15 minutes while I checked my reflexes and reactions. They seemed OK so I made the landing, taxied in and shut down.

Now I had time to look back on the mishap and its cause. Since the hypoxic condition was recognized in time, the end result was not serious. But suppose I had been leading and on actual instruments?

In this squadron, all pilots' oxygen masks are kept in the flight equipment room. Prior to each hop, the pilot's mask, mini-regulator and hose are assembled for him. This is necessary because the squadron has 10 to 12 mini-reg oxygen hoses, 16 mini-regs and 27 pilots. (Since this incident, this shortage has been corrected.—Ed.) Aircraft are launched in A.M., noon and P.M. groups of 8 to 10 aircraft. Pilots do not fly two consecutive flights but may fly an A.M. and P.M. hop. Under these conditions, the regulators are constantly changed from one mask to another. The supposition is that, eventually, a bad connection will be made between a regulator and a mask.

My mask had checked OK on the Douglas tester for both oxygen and communications. However, I did not tug at or inspect all connections. The pre-takeoff oxygen check in the aircraft was good and the mask fitted properly. I have no idea when the regulator separated from the mask. The unit was still attached to the mask by the communications wires, giving the same feeling of weight. My preoccupation with the chase hop and non-familiarity with the positive pressure system were probably why I did not notice the loss of pressure and ease of breathing. This mishap could have been prevented by proper installation of the mask to the mini-reg. A thorough check by the pilot prior to flight is mandatory as long as regulators are being changed between flights. ●



KEEP IT CLEAN!

YOUR oxygen mask stands between you and hypoxia. It's common sense life insurance to keep it clean.

Investigations have repeatedly disclosed that dirt and gummy substances in oxygen masks have been the cause of sticking valves. Why is the dirt present?

- Too long a period between cleanings.
- Improper cleaning procedures.
- Improper disinfecting procedures.
- Some units are cleaning masks only at 30-day intervals.

Cleaning Methods: Soap and water are the best and the only materials authorized for cleaning oxygen masks. (Cleaning is, of course, a job for your parachute rigger.) BACSEB 27-54 states that cleaning shall be carried out as follows:

A. Wash check valves, ice shields, mask exhalation valve and mask *thoroughly* inside and out with lather made from cleaning compound, Specification NavAer C-120, and warm water. *Caution:* No toxic or flammable solvents should be used for this purpose.

B. Rinse thoroughly in clean, cold water.

C. Wash the A-13A compensated mask exhalation valve. Shake out water and allow to dry. Do not blow out valve with compressed air as this may damage the valve.

D. Clean the mask microphone with a damp cloth.

E. Dry mask and accessories in a ventilated place. Do not hang mask in sunlight.

Disinfecting: Soap and water is a good disinfectant. Also authorized is 1:1000 aqueous solution of benzalkonium chloride (Zephiran) Using a gauze pad moistened with this solution, thoroughly swab the interior of the mask. Special care should be taken to assure penetration of disinfectant into inner crevices.

Frequency of Cleaning: It is recommended that masks be cleaned at least once every 30 days. However, experience has taught that where masks are in constant everyday use they should be cleaned as frequently as required by the service conditions.

Storage: Special care must be taken in the tropical regions to store the masks in such a way as to insure ample ventilation without exposing the mask to excessive heat or direct sunlight. One method is to enclose the mask in a bag manufactured from a porous material to protect it from dirt, dust, etc., and suspend it in a clean, ventilated space.

Technical Instructions Applicable:

BACSEB 7-54 Oxygen Equipment; aviators' breathing — preflight and flight procedures

BACSEB 27-54 Oxygen Face Masks; cleaning instructions for

BACSEB 42-54 Oxygen Systems; diluter-demand — general information

BACSEB 50-54 Oxygen Mask; A13A inhalation check valve—modification of

BACSEB 2-56 Oxygen Mask; type A13A, stocking, issue, repair, modification and testing of

BACSEB 16-57 A13A Oxygen Mask; sizes medium and small, manufactured by the Acushnet Process Co., microphone cavity, modification of

BACSEB 29-57 Oxygen Mask to Regulator Connector Assembly; Type MC-3, modification of

BACSEB 17-58 Oxygen Mask; Hardman 3740, retention kits for type APH-5 helmets; instruction for installation

BACSEB 8-60 A13A Oxygen Mask Exhalation Valve — (Bendix P/N 29211-B1 and Firewal P/N F1732) miniature oxygen regulators; chafing of

Handbook Maintenance Instructions 03-50-1
Handbook Operation, Service and Overhaul Instructions with Illustrated Parts Breakdown (Navy) AN 03-30B-16

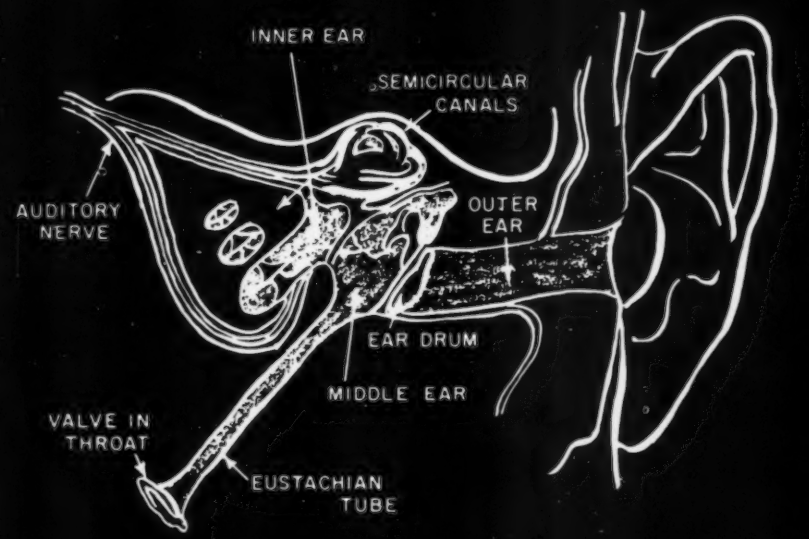
NavAer 03-50B-503 Handbook Overhaul Instructions ●

THE EASY WAY

WITH more and more extensive use of liquid oxygen in modern Navy aircraft the problem of ear discomfort after flights conducted on 100 percent oxygen is becoming a more frequently voiced complaint. In order to publicize recommended remedial action the following is reprinted from the USAF publication, *Your Body in Flight*.

"Flyers who have been breathing pure' oxygen at high altitude for a considerable period sometimes develop an earache two to six or more hours after landing, even though their ears cleared during descent. For instance, ear pain may awaken them after they have gone to bed, or be present on awakening in the morning. This occurrence is due to the fact that after a flight on 100 percent oxygen, the gas in the middle ear has a very high oxygen content rather than the normal 21 percent. Oxygen is normally absorbed into the middle ear tissues at a slow rate. The usual periodic swallowing allows entry of sufficient new air to maintain the proper pressure within the middle ear cavity. When the oxygen content in the cavity is very high, however, absorption is more rapid. Therefore the normal rate of ventilation is not sufficient to maintain the 14.7 psi pressure required for equilibrium, and a reduced pressure or partial vacuum develops within the middle ear.

"Prevention of this condition is simple, but too often overlooked. For one or more hours after landing, flyers should perform the 'Valsalva maneuver' every few minutes. This is the same action of closing the mouth, holding the nose, and blowing gently which is recommended for opening the Eustachian tube valves during descent. Frequent Valsalva insures maintenance of proper pressure in the middle ear cavity despite the rapidity of oxygen absorption. Equally important — with each Valsalva maneuver on the ground a slightly increased pressure is built up in the middle ear and the excess gas is expelled through the Eustachian tube. In effect, then, you are flushing the middle ear cavity with air containing 78 percent nitrogen. The proper gaseous concentration is soon re-established and your normal rate of swallowing is again adequate to maintain the pressure as oxygen is absorbed. Because of the slowed rate of swallowing during sleep, this preventive procedure is particularly important if you are going to bed shortly after landing." ●



SEA-
Sick, Sick, Sick

"Actually I don't feel ready to try. Perhaps one more comprehensive briefing. . . ."

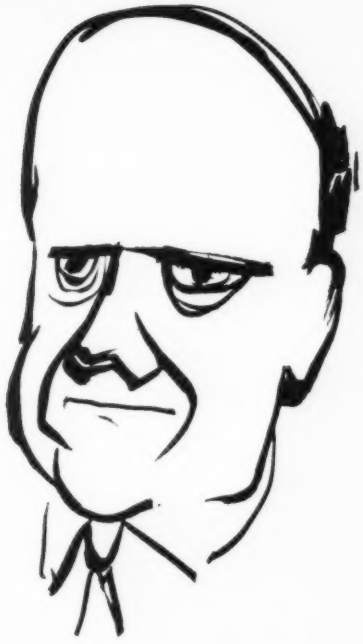
". . . exactly how much is the deck pitching?"

"Planning takes the fun out of it. When you get close ask for a practice DF steer . . ."

"Nothing to it. Latch on to CCA and ride the rails down to where paddles can talk you down."

"Are you sure this forecast is accurate?"

"Just follow written SOP."



"I flew F6s for years and never blew a tire."

"Find somebody to lead and I'll go . . ."

"The Med? Just memorize the letdown for Nice and carry plenty of divert money."

OPERATION DESCENT

I reached for my knife and found to my dismay that it was in my other flight suit . . .

ON A routine two-plane intercept training flight, an F4D pilot experienced a flameout which was probably due to fuel starvation. After several unsuccessful attempts at airstarts he prepared to eject. Here is his account of subsequent events:

"I lowered my visor, positioned myself and pulled the face curtain. The canopy left the aircraft immediately and after a slight delay, the seat fired. (Altitude was about 5500 feet.) At this time I was in the clouds. I felt the seat belt open immediately followed by deployment of the chute. Shortly thereafter, I descended out of the clouds and observed the aircraft crash about two miles away.

"At this time I felt rather elated that I had escaped, although the ejection and chute opening had knocked the wind out of me for a moment. I attempted to sit back in the chute and found it impossible to do so. I retained all my gear but unintentionally dropped my oxygen mask when I removed it. I experienced slight difficulty attempting to turn myself so as to face forward upon impact with the water. I located the quick release fittings on the chute, placed my left hand on the chute release and the right leg strap release.

As soon as I hit the water I released both of these and with no difficulty freed my left leg. The parachute dragged me by the pararaft lanyard for a few feet, then collapsed. After getting out of the parachute harness and inflating the life vest, I experienced some difficulty releasing the quick release of the pararaft since it was under water. After two or three minutes I had the raft out and inflated. On climbing into the raft, I felt a tug on my left foot and discovered it was entangled in several shroud lines. I reached for my knife and found to my dismay that it was in my *other* flight suit.

"I removed my boondockers and was fortunately able to work the lines off. I placed one dye marker in the water and retrieved the survival container.

"At this time I observed an F4D circling an area to the north that I assumed was the spot where my aircraft had crashed. Shortly thereafter, an SNB and a P2V arrived and circled the same area. They were only one or two miles away and I expended two day smoke flares but they did not spot me—probably because I was upwind and upsun of them. Finally an SNB headed directly for me and I lit a smoke flare as it approached. He appeared to spot me immediately and shortly thereafter the chopper arrived." (Rescue was by helicopter rescue seat.)

● The pilot actuated the bailout oxygen bottle prior to ejection but there was no flow of oxygen to the mask. The bottle was recovered along with the parachute and the hose and associated fittings were normal in all respects. It is therefore assumed that the bottle was either empty or had been tripped prior to this flight. The pilot did not check the pressure gage on preflight.

● The pilot had received training in survival swimming, Dilbert Dunker, and ejection seat indoctrination less than two weeks before the accident. His successful ejection and water landing speak for the effectiveness of this training. Although, unlike most of the pilots in his squadron, he had not experienced an actual helicopter pick-up, he had no difficulty with this phase of the rescue. ●

Good equipment– Endless training and

THE WILL TO LIVE

THE individual's will to live is an important factor in successful survival. A case in point is the incredible survival of an S2F crewman who with both legs broken stayed afloat until rescued some 20 minutes after the plane crashed on a night carrier takeoff. He was the only survivor.

The crewman was sitting in the left rear MAD-ECM seat. Although he was not braced for the impact, his harness was tight and his inertia reel fastened.

"I remember being thrown forward and to the right toward the aisle," he states in the accident report. "The next thing that I remember is being in oily water and separated from the plane. (The calm sea with some swells was in his favor.) I tried to swim and found that I was still strapped to the seat although clear of the plane. When I moved, the seat moved with me. I thrashed around, and the seat began pulling me down. I attempted to slip out of the shoulder harness, but this was not effective. I became scared and felt that this was the end. Then as

I began to sink deeper, I remembered the lap belt and opened it. I was then able to free myself from the seat and reach the surface of the water.

"On the surface, I pulled both toggles of my Mk II life jacket. They did not function and I felt no buoyancy.* I managed to get back to the surface of the water and hold on to a hatch cover. It didn't seem to provide very much support and I soon let go. On the second try I was able to inflate my life jacket orally and then I received some support. I found myself in very oily water with a lot of small debris. I could see no evidence of anyone else from the plane nor could I see the plane or any large segments of it. I thought I saw a hardhat floating by in the water; mine was still on my head. There were several smoke bombs burning in the water. A plane came over

*One chamber of the Mk II life vest had numerous cuts. The other chamber, along with the oral inflation chamber, was intact. It was assumed that the intact chamber did not inflate because the retaining cap on the CO_2 cartridge container was not tight or the cartridge was not properly charged.

Water survival training helps aircrewmen stay alive.

with its searchlight on and I waved, but it went on by.

"I pulled out a flare from my life jacket and attempted to fire it but it was slick with oil and I had a very difficult time. Finally I got the flare to fire, but it only burned for a very short time. After the flare went out, I attempted to restart it again but with no success.

"Then I saw a destroyer in the distance and fired my pistol with tracer bullets five times. I do not remember loading the pistol in the water but I must have since I did not load it prior to the crash. As I fired the last bullet, the destroyer had its searchlight beam on me as the ship came up closer."

A swimmer from the plane guard destroyer (which had located the survivor by the tracer bullets) dove into the water, swam to him and towed him to the ship. He was hauled aboard by means of a rope about his shoulders.

Training played a large part in the crewman's survival. In addition to standard survival lectures, he had attended a water survival school in Japan in 1959. He is a Red Cross water safety instructor and feels that this training was quite important in his survival.

"I also feel that the survival equipment lectures and demonstrations given by the parachute riggers in my present squadron and my last squadron were very helpful," he observes.

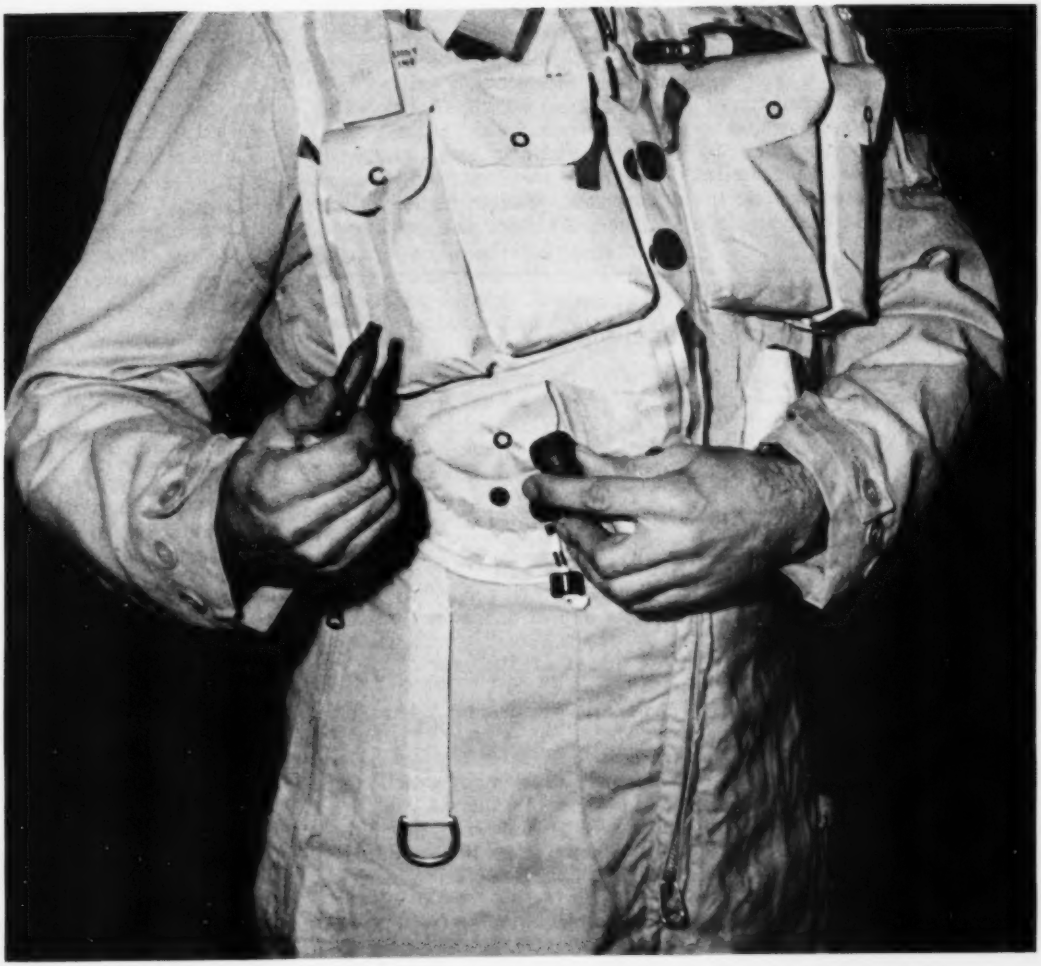
The reporting flight surgeon states that the survivor demonstrated extraordinary coolness and excellent judgment.

"This man exhibited an admirable degree of motivation to survive and was able to surmount obstacles that would have led to the death of most persons. He maintained himself in the water for 22 minutes with two broken and useless legs; he orally inflated his life jacket when CO_2 inflation failed; he opened and ignited an oil-slick flare; and finally he loaded his tracer pistol and fired five times."

The flight surgeon recommends:

- Continued use of the Dilbert Dunker for air crew and pilot training.
- Relatively frequent water survival courses for all pilots and air crew.
- Continued emphasis on the use of survival equipment, especially in locating and firing the flares in the dark.
- Practice in loading the pistol in the dark. ●

KNOW
BEFORE YOU GO!



CHECK THE CO_2 CARTRIDGE

SHARK CHASED

UNDER the overcast, the night was black. Seas were moderate. The Canadian S2F out of Dartmouth, Nova Scotia, was bound for Bermuda. Shortly after midnight the pilot experienced navigational aid difficulty and became disoriented. When the plane reached a low fuel state, it became imperative to ditch. The pilot set down on instruments with power. The S2F bounced on impact then settled on the water. Minutes after the five occupants had evacuated the aircraft, it sank. The aircraft's multi-place life raft inflated but became wedged under the elevators and sank with the plane. The survivors' flotation gear comprised their life vests and two one-man life rafts. They were 150 miles from Bermuda.

Twenty minutes after the ditching, a Coast Guard P5M from Bermuda sighted the survivors' night distress signal and dropped life rafts and other emergency equipment upwind of them. At first, the men were not able to paddle to the larger rafts. However this situation changed rapidly. At daybreak, sharks began to circle the two rafts and the men in the water. Shark chaser proved effective and drove them away. One man used his hard hat to punch the nearest shark on the nose. Shortly after this episode, "inspired by the sharks," the crew reached the two large rafts.

The P5M continued to orbit until arrival of a merchant vessel a few hours later. The ship picked up the survivors and transferred them to a Coast Guard cutter.

Among the survival points brought out in the SAR reports were:

- Shark chaser was effective in dispersing at least three sharks.
- The aircraft crew stayed together and all were rescued; the pilot controlled the situation.
- The aircraft drops of rafts and other emergency equipment were slightly upwind of the survivors, as would normally be the case; however, the rafts were difficult to reach because the "built-in" sea anchors on the survivors' one-man rafts were not too effective as drogues.

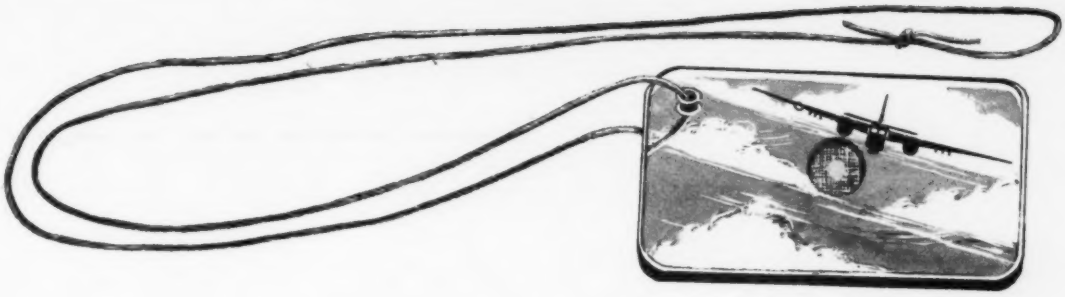
In closing, here's a question for all APPROACH readers to meditate upon: What would have happened in this survival situation if the airmen had been minus life vests or if their life vests had been minus shark chaser?

(If you want more straight scoop on sharks, get a copy of NavAer 00-80Q-14, "*Shark Sense.*")

Shark Repellants

There is no known case of a man having been attacked by a shark on dry land. However, those who follow the sea occasionally find themselves in the briny deep. Here are some tips given by the Office of Naval Research.

- Do not abandon your clothing since it is your only protection against a shark's rough skin.
- Place wounded in a life raft. If there is room in the raft all survivors should get in as soon as possible.
- Remain quiet. Conserve your energy.
- If swimming, use regular, rhythmic strokes either strong or lazy but keep them rhythmic. Sharks appear more sensitive to unrhythmic, thrashing noises.
- Don't trail arms or legs over the side of a raft.
- Don't jettison blood or garbage.
- Do not fish from life raft when sharks are present. Abandon a hooked fish if a shark approaches.
- When a shark is at close range, use Navy shark repellent. The noxious odor plus the black dye will repel many species of sharks. The dye helps obscure the swimmer. (Contrary to the once common supposition that sharks are nearsighted, they have an almost unbelievable capability to discern objects in the water.) Navy shark repellent simulates rotting shark's carcass which is offensive to several species.
- If you are threatened by a shark while in the water, form a tight circle and face outwards. If approached, hit the shark on the snout with any instrument at hand, preferably a heavy one. Hit a shark with your fist only as a last resort, experts say.



Mirror and Dye

THE pilot of an F8U-2 ejected at 28,000′ over a bay after a mid-air collision with another F8U. After a successful descent and entry into the water, he inflated his life raft and climbed aboard. A few minutes later an FJ-4 was overhead. The survivor flashed his signal mirror across the path of the FJ and later signalled an S2F and a T28-C which had converged on the scene. The orbiting pilots stated that in spite of the broken clouds and overcast the reflected rays from the signal mirror were clearly visible and were an excellent means of determining the survivor's position.

The dye marker which the survivor attached to his raft was clearly visible from a great distance in the air and aided in establishing an orbit around the area. He was picked up by helicopter.

Non-Standard Helmet

THE pilot and crew of an AD-5Q bailed out of the aircraft after engine trouble followed by fire. Outside the aircraft as the pilot passed the left rear compartment, he hit the left rear crewman who had caught his parachute on his seat. In reconstructing the pilot's bailout path, investigators concluded that the pilot then hit the outboard tip of the leading edge of the left horizontal stabilizer. This blow to his head which knocked his helmet off was severe enough to render him unconscious and might possibly have caused a fatal injury.

The pilot was never found. His helmet, a Bill-Jack model D8, was picked up from the water by a ship. Examination revealed the left side to be crushed inward and the right side to be displaced outwards. Further, a USAF sun visor and Hardman fittings had been installed—modifications for which the accident investigators were unable to find official authorization. Such alterations not only weaken the basic structure of the helmet itself, the flight surgeon states, but they also alter the distribution and absorption of impact forces. It is the opinion of the reporting flight surgeon that if the pilot had been wearing the recommended APH-5 helmet, his chances of survival would have been greatly increased.

Rips and Tears

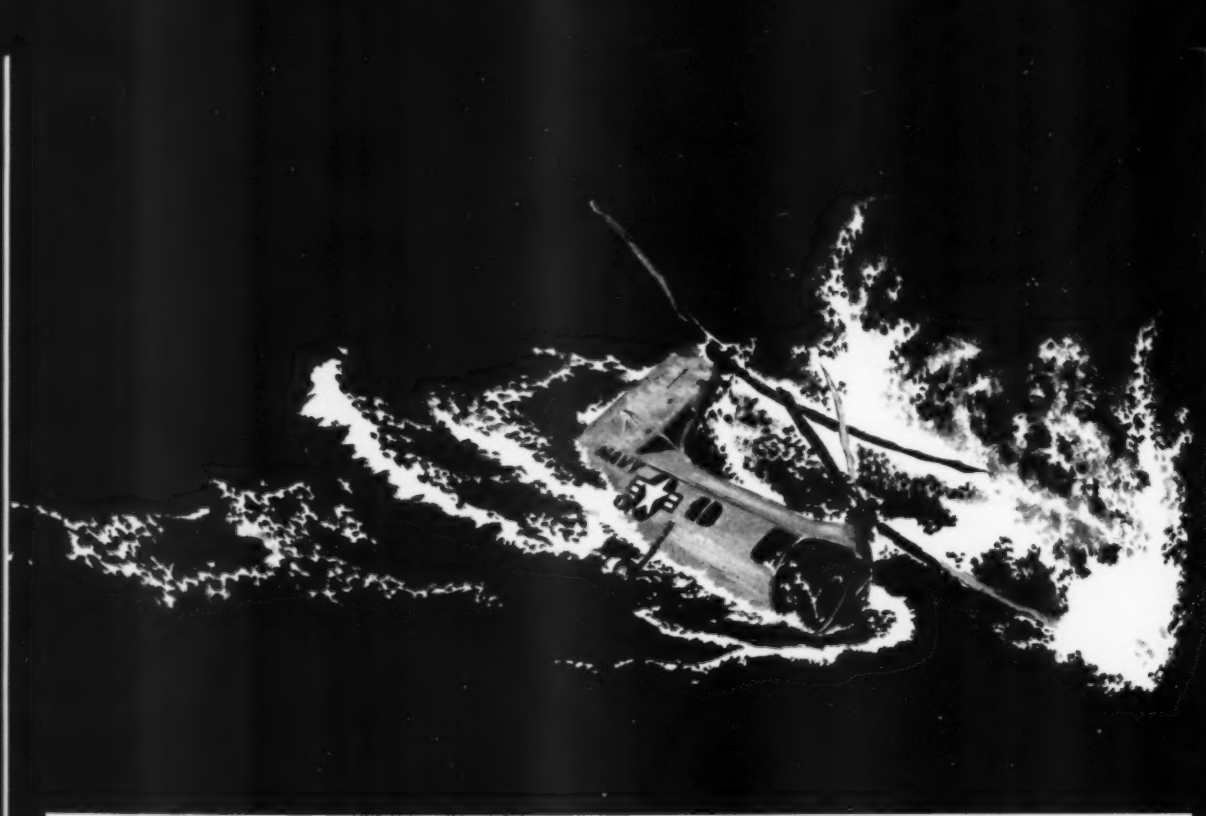
"SEVERAL men in the squadron are in the habit of allowing various rips and tears in their flight suits to go unrepaired," a flight surgeon reporting on a recent accident states. "This is felt to be a bad practice safety-wise for two main reasons: 1) Rips, tears, etc., in the flight suit will impair its fire protecting qualities and 2) The loose edges or the gaping hole of a rip or tear will more easily become 'hung-up' or snagged than will an intact flight suit and thus might hinder the wearer in making an emergency escape."

This problem can be corrected, the flight surgeon suggests, by action on a squadron-wide basis.

With Us Still

MUCH has been written about failure of life vests because of improper securing of CO_2 cylinder container caps but the problem is with us still. Here are a reporting flight surgeon's words on a recent instance:

"An occurrence in this helicopter accident which needs comment is the failure of the aircrewman's mae west. One compartment inflated in the normal manner. The second compartment did not inflate at all. This was due to the fact that the metal holder for the CO_2 cartridge did not have the cap screwed on tightly. Consequently the firing pin pushed the CO_2 container up and did not pierce the end. The individual involved is a poor swimmer and stated that every time he tried to inflate his mae west orally he began to sink and so he quit trying. He is also a large individual and one compartment of the mae west was not sufficient to support him adequately. This problem should be widely publicized and everyone should be cautioned to check the CO_2 cartridge caps carefully and often."



TOO LONG

THE pilot and crewman launched from the carrier in a HUP-2 about 1715 on a daylight plane guard mission. A deck respot was in progress in preparation for the recovery of fixed wing aircraft. During this delay in flight operations, the pilot made a practice low altitude approach to a hover over the water. A satisfactory hover was established except for spray being churned up at approximately 10-15 feet of altitude. Altitude was increased to 25-30 feet plus turning 90 degrees to the left. Again a satisfactory hover was established.

Suddenly without warning, the helicopter started a backing motion, a left turn and began losing altitude. Within moments, in spite of attempted corrective action, the helicopter crashed into the sea. (Later, it was concluded in the investigation that the cause of the accident was material failure.)

The aircraft struck the water, nose low and in a left bank, and rolled on the left side shearing the rotor blades. Impact was not

Whether the CO_2 cartridge was too short or the cartridge container was too long —the error should have been found during the acceptance check of the life vest.

excessive. The aircraft settled into the water and sank in approximately 30 seconds.

Water poured into the aircraft especially through the open hatch on the port side aft. On impact both forward cockpit windows had been open; now the starboard window was closed part way. Water was up to the middle of the pilot's chest by the time he got his seat-belt unfastened. When he and the crewman stood up, water was waist-deep in the sinking aircraft.

The two men, fearing that they might be trapped inside the plane, did not stop to get their life rafts.

The pilot and crewman headed for the starboard cockpit window to escape from the aircraft. Together they pushed the window back and swam out.

Waves estimated by the pilot to be 8 to 10 feet submerged the two men frequently. The pilot didn't think about inflating his life vest until the crewman informed him that he couldn't inflate his own vest. Although both men tried to inflate the crewman's vest by means of the CO_2 cartridge, all attempts failed. The pilot inflated his own vest and told the crewman to hold on to his neck. The crewman did so, swimming and treading water to keep afloat.

In an interview later, the crewman stated that he had not checked his life vest prior to the flight but that the crewman using it before him had. This crewman when questioned reported that he had definitely inspected the life vest and that the CO_2 cylinders were good and the cylinder container caps were properly secured. A rigger aboard the carrier checked the faulty vest and found that in eight tests of each side of the vest inflation did not take place. Further examination revealed that the CO_2 cylinder containers were ⅛ of an inch too long through manufacturing error. Shimming the cap inside ⅛ of an inch produced full inflation on subsequent tests.

The two survivors could see the carrier every now and then and were greatly concerned that the ship did not appear to be turning. They were unaware that the crash had been observed, smoke flares had been dropped from the carrier to guide rescue vessels and a plane guard destroyer was already on its way to the crash scene.

The pilot attempted to light a signal flare by pulling the top instead of levering the cap by striking the ring over the edge of the flare. Finally the flare ignited. Rescue personnel later reported it aided in locating the survivors.

Meanwhile, the crewman, unable to inflate his life vest orally, was becoming more and more fatigued in his fight to stay afloat.

The reporting flight surgeon in the MOR states that malfunction of the crewman's life vest could have been fatal to the crewman had rescue been delayed. The manufacturing error getting by undetected was apparently the result of inadequate or incomplete inspection of equipment. The discrepancy should have been caught locally during the parachute rigger's acceptance check prior to placing the life vest in service. (Refer BACSEB 22-58A, Vest, Pneumatic, Mk 2, instructions for use, maintenance and inspection.)

As the pilot and crewman were looking toward the carrier and wondering why no one came, they sighted the plane guard destroyer coming up behind them. Shipboard personnel threw life rings and lines to the survivors. The crewman grabbed a life ring and was towed aft and hoisted aboard near the stern. The pilot secured a rope around his body and was hoisted aboard amidships.

The crewman suffered from mild exposure and fatigue. The pilot was in good condition and was only moderately fatigued. They had been in the water 10 minutes.

All the helmets of the carrier's helicopter detachment had been painted with red "Day-Glo" paint. The commander of the destroyer squadron who was aboard the plane guard destroyer told the rescued pilot that the survivors' red hardhats bobbing up and down in the waves and white caps were very easily seen . . . that they were the only thing visible to him and the skipper of the ship and had greatly facilitated piloting the ship for the rescue.

BACSEB 1-60 distributed to the field after this accident took place, recommends the use of reflective tape on pilot's protective helmets in lieu of fluorescent paint. ●

A booster shot for your hangar deck/flight deck safety program

HAS your flight deck/hangar deck safety program lived up to its expectations? You may believe it has, but a quick look at your facts and figures may change your mind.

In the past fiscal year 59 percent of all accidents were caused by personnel errors. By strictly adhering to safe operational procedures, a vast majority of these accidents could have been prevented. However, 95 percent of all crunches on the hangar deck and flight deck of an aircraft carrier are caused by human error. Therefore, this is perhaps the most fertile area to look into in improving your safety program.

Carrier men are facing a real problem. On the large FORRESTAL class carriers, there are at times, nearly 50 planes on the hangar deck. On the ESSEX and MIDWAY class carriers space is just as precious.

This situation is constantly a challenge for the yellow-shirted plane directors. They are continually working in tight quarters and have a limited amount of time to deliver planes to the flight deck —a job which sometimes requires moving several aircraft. In addition they have to ensure all equipment is properly secured to the deck. Directors on the flight deck have similar problems, as they must move aircraft expeditiously in tight quarters. Aircraft are continually being moved for either launch or recovery. These directors need assistance in preventing crunches.

The old philosophy—saving a few cents a day

by Lloyd R. Teets, Jr. JO2

makes a nest egg by the end of the year—easily applies to safety prevention.

Aircraft parts are expensive. A small aluminum elevator tip assembly for an A4D costs $10. A stabilizer tip for an F3H costs nearly $100. And the cost of a nose cone for the F8U is $600. The radome assembly for the F3H costs $1020, while the same nose cone for the A3D is approximately $3000. The total cost of crunches over a period of a few months runs into several thousand dollars, *and many extra working hours.*

Accident investigators, after a careful analysis of the hangar deck-flight deck safety program aboard INDEPENDENCE made the following recommendations:

1. Keep a log of deck crunches so that definite action might be taken in case of personnel causing repeated incidents.

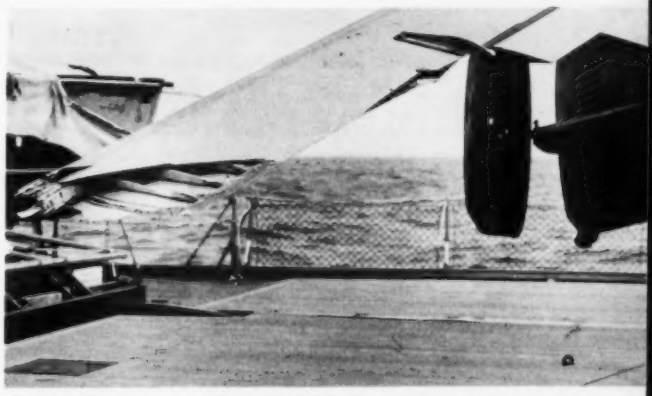
2. Investigate the cause of each crunch (Air Department) to determine which cases should be brought to the attention of the Commanding Officer.

3. Slow down tractor drivers towing aircraft. Fast movement of aircraft was found to be the cause of many deck crunches.

4. See that all personnel working on the flight deck are wearing ear protectors and goggles whenever they are required. Ear protectors will save a person's hearing from damaging sounds produced by jet aircraft and goggles will protect the eyes from fuel and foreign material which is

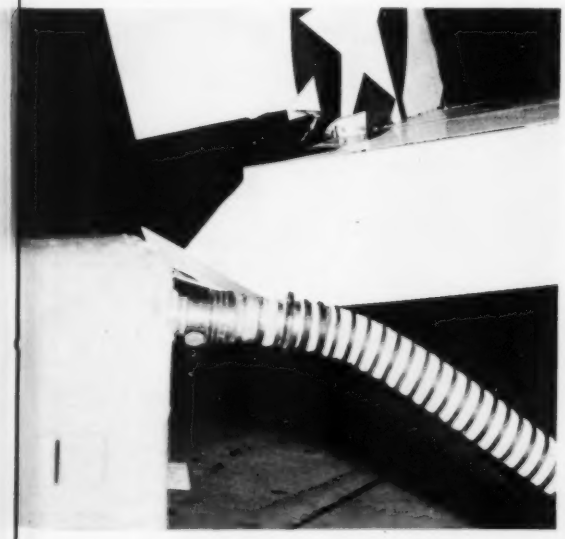
Continued next page

Just about the worst enemy of Fleet Readiness is the inexcusable aircraft crunch. This enemy robs the Fleet of many man-hours, much money, and wastes flight and hangar deck space. Some examples: below, counterclockwise:

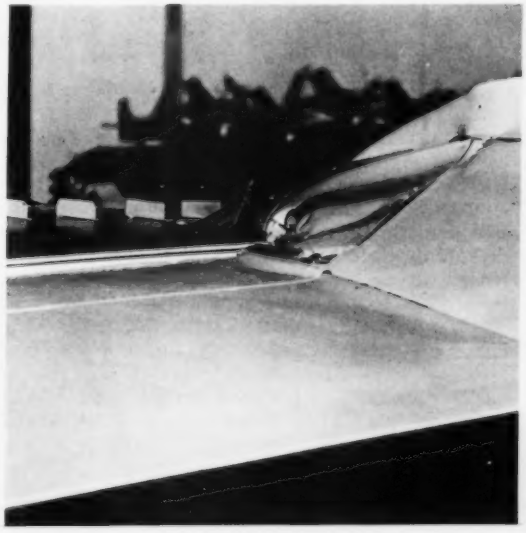


Air starter bangs up F4D flap requiring downtime for repair and man-hour loss.

One hundred eighty man-hours required to repair A4D wing crunch was beyond squadron capability necessitating a replacement aircraft before deployment.



Minor damage becomes major aboard ships carrying a lone helicopter because of limited space, spares and qualified mechanics to accomplish repair.



Movement of million-dollar aircraft such as the F8U from flight deck to hangar deck via deck-edge elevator requires precision teamwork among flight deck, elevator and hangar deck crews.

often blown through the air. At the same time signals will be better perceived.

5. Plane captains man the cockpits of their aircraft and tend brakes until the aircraft are properly secured. The hangar deck and flight deck of an aircraft carrier are not always stable. A rapid turn can send an unsecured aircraft into other aircraft or over the side.

6. Secure tractors and aircraft starting units by means of chocks and tie-downs at all times when they are not operating. This also applies to support equipment. Unsecured tractors, aircraft starting units and support equipment often inflict damage to aircraft.

7. Make all plane directors carry whistles when on duty—his assistants must be able to hear signals above the din of the flight and hangar deck noises.

To implement the above recommendations, INDEPENDENCE assigns three Safety Petty Officers the sole purpose of patroling the hangar and flight deck of the ship to prevent crunches. Each Safety Petty Officer wears a special red and yellow sweater and is considered an expert in the field of safety. Each is familiar with all hangar deck-flight deck safety regulations, instructions and handling procedures. These petty officers are the backbone of the "Prevent-A-Crunch" program.

Two of the Safety Petty Officers work on the flight deck. One is furnished by the Air Group, the other by the ship. The ship also furnishes the Safety Petty Officer for the hangar deck.

Many, many man-hours will be used before this F3H *Demon* is restored to operational status.

Lloyd R. Teets, Jr. is a Journalist Second Class aboard the USS INDEPENDENCE and editor of the ship's magazine, "The Declaration." He attended Recruit training and Journalist "A" School at Great Lakes, Illinois, after graduating from high school in 1958. Prior to reporting aboard INDEPENDENCE he was Editor of the "Mainsheet," base paper at the U. S. Naval Training Center, Bainbridge, Maryland, and has served six months with the Fifth Naval District Public Information Office. He is a native of Snover, Michigan.

The safety men on the flight deck ensure compliance with all safety procedures and handling regulations. They continually walk the flight deck on the lookout for causes of crunches. They correct all discrepancies. They see that all gear adrift is returned to its proper place, and remove from the deck foreign material such as paper and rags which could be drawn into the jet intake of an aircraft.

The hangar deck Safety Petty Officer performs similar duties. He checks to see all support equipment is properly secured to the deck, and during aircraft refueling, that fire extinguishers are nearby in case of fire. He also watches for spotted aircraft that may be making the damage control or first-aid locker inaccessible. When aircraft are being spray painted he makes certain there is proper ventilation.

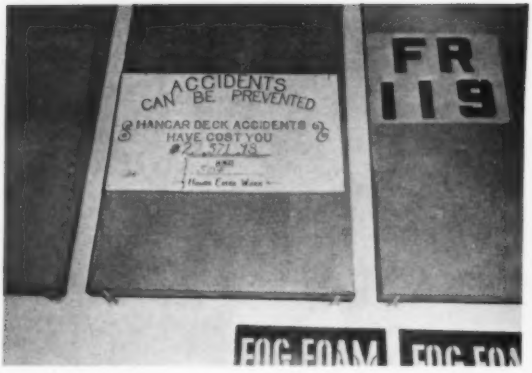
Action must be taken to guarantee that once a crunch occurs the same "crunch" is not allowed to occur again. A "Prevent-A-Crunch" discrepancy report chit is used. This report chit is intended to facilitate corrective action rather than for disciplinary purposes.

The front side of the chit is used for the Safety Petty Officer's name, the time of the discrepancy and date. Below, the unsafe condition or situation observed, corrective action taken, recommendations and the Safety Petty Officer's signature are written.

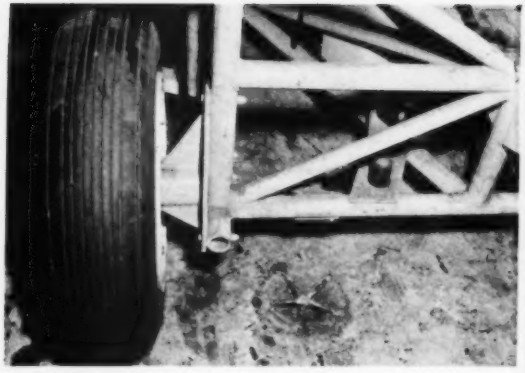
On the reverse side of the chit ample room is given for the date, action taken by the division or squadron concerned and signature of the officer within the division or squadron handling the chit.

Once a Safety Petty Officer spots a discrepancy he fills out two discrepancy chits on the person,

Model MD-1A tractor, properly handled, is important support equippage for A3D *Skywarrior*.



This "Prevent-A-Crunch" board is prominently displayed in INDEPENDENCE'S hangar bay, above the Hangar Deck Control room.



This piece of maintenance equipment if not tied down, can cause considerable damage to an airframe.

division or squadron responsible. He points out the error to the person involved and how the discrepancy or situation is to be corrected.

If the Air Department Office does not receive the original copy from the division or squadron concerned within a reasonable time, a memorandum is sent to the division or squadron reminding them to take corrective action and to return the chit to the Air Department Office.

The "Prevent-A-Crunch" program also has a board prominently displayed above INDEPENDENCE's Hangar Deck Control room showing the cost and manhours involved in maintenance work sustained from crunches.

Crunches appear to stem from a sequence of events. Stop this sequence of events and you prevent a crunch.

Although a monetary savings figure cannot yet be determined from the "Prevent-A-Crunch" program, it is evident that the program is saving money, man hours and improving "Fleet Readiness" by providing more aircraft in a flying status. ●

Seventy crunch-free days of handling aircraft on hangar deck were chalked up by hangar deck crew 12 aboard USS INDEPENDENCE. Capt. Harvey P. Lanham, Commanding Officer, congratulates aviation boatswain's mate third class K. G. Awes, hangar deck director, while other members of crew look on. At left background are LCDR G. R. M. Pearson, hangar deck officer, and CDR R. W. Drewelow, Air Boss.

AIR POWER

Since different aircraft loads call for different tire pressures the exposure of mechanics to possible wheel explosions has increased.

Take care with high pressure air—be sage, use an accurate gage!

IMPROPER use of high pressure air servicing equipment has caused a number of costly accidental explosions. Here is a series of identical conditions which were in evidence either partially or completely in the bulk of these accidents:

√ operating personnel were not adequately trained to handle the equipment or task assigned.

√ equipment being used was not designed for the specific operation being considered.

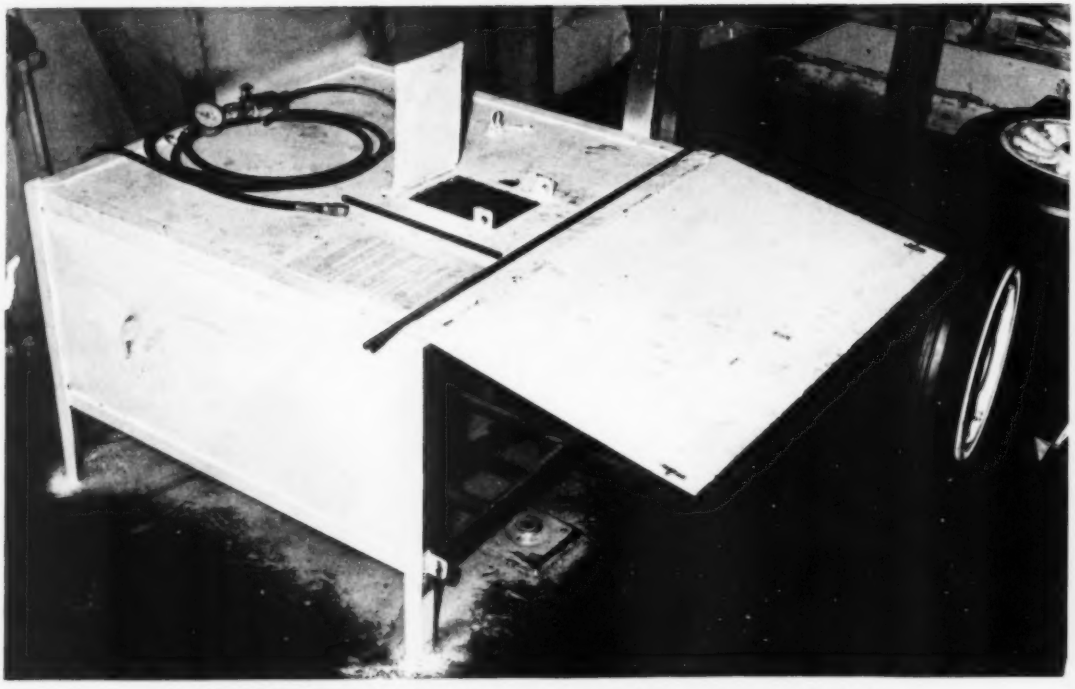
√ the hazard potential of high pressure air was not known or was ignored.

√ supervisory controls were deficient and in some instances completely lacking.

√ established safe air pressure limits and capacities were not considered or were not properly interpreted.

√ pressure differentials between the air supply source and air receiver were not controlled by approved pressure reduction or regulating devices.

√ pertinent technical orders or other regulatory publications were not consulted to determine



Steel tire inflation cage equipped with blowout panel on the bottom. Elevation off the deck permits force of any explosion to dissipate safely downward. Door on top permits connection of hose.

approved procedures prior to start of operation.

BuWeps Inst. 13420.1, 17 Nov 1959; CNAL Inst. 13490.1; CNAP General Aircraft Bul. 8-60 apply. Note: It is suggested NASC Poster, 5ND 4641 (Nov. 4-59) "Aircraft Wheels, Tires and Tubes, Precautions to be Observed when Handling Tires," be posted at all air pressure sources. Additional copies are available from NASC.

Gage Calibration

AN INACCURATE gage can lead to overinflation and tire explosion. Pressure gages should be regularly checked to insure that they are accurate and operating properly. Here's what BuWeps Instruction 5101.1 of 7 Dec 1960 has to say about the procedure:

► All dial types gages used for measuring aircraft tire pressure and similar applications are to be checked for accuracy and satisfactory operation at least once a month. Pressure Gage Tester, Dead Weight Type, Capacity 10 to 1000 psi, Federal Stock Number G6685-283-0658 provided in applicable allowance lists (Section "G" and "TBA") is to be used for this application.

► The gages shall be checked at ¼, ½, ¾ and at the full gage range. Gages not accurate within 3 percent of full gage reading throughout these ranges shall be rejected. Rejected gages shall be returned to the Local Supply Department as prospective RB/RE stock. Gages which have passed the tests shall be returned to service. After testing insure that the gages are clean. The internal surfaces of the Bourdon Tubes should be thoroughly cleaned with trichloroethane FSN G6810-664-0387 or trichloroethylene FSN G6810-184-4794 until it is free from hydrocarbon deposits and then dried by circulating air. Under no circumstances should carbon tetrachloride or caustic solutions be used for cleaning of the Bourdon Tube.

► Each gage returned to service shall be marked with the date on which the next test will be required. No gage shall be used unless it has been tested, approved and dated.

Aviation Maintenance

AS CARRIER aircraft become more complicated, larger, and fly faster, there is also a requirement for increased attention to maintenance quality, maintenance supervision, and quality control. Statistics compiled at the Naval Aviation Safety Center show that accidents attributed to maintenance factors during the past fiscal year have increased approximately 25%.

In view of the keen competition between naval air units and the natural desire to be considered the best, aircraft readiness and availability are often maintained at the expense of not correcting minor "non-downing" or "next pilot check" type discrepancies. This procedure, though aimed at keeping the maximum number of aircraft flying, is extremely difficult to administer and control. In addition, it creates the impression among personnel that an aircraft condition short of 100% ready for flight is acceptable. This is not true!

Commander Carrier Division SIX desires that this Division conduct a review and correct if necessary, the following aspects of air group and squadron maintenance.

a. Insure that quality control divisions are staffed with the best technical talent to implement and supervise a full time rigorous quality control program.

b. Make maximum use of available maintenance training courses to achieve the highest possible state of maintenance capability.

c. Insist on firm maintenance administrative procedures to insure maintenance directives reach their intended user and *are implemented.*

d. Require full compliance with BuWeps Material Reliability Program in order to provide BuWeps and industry with the tools for improving aircraft maintainability.

e. Insure that no pilot accepts an aircraft for flight or is expected to fly an aircraft which is not in all respects "Ready for Flight."

Attention is also directed to the fact that there has been a tendency in recent years to measure the success of a deployment in terms of flight hours compiled and each succeeding deployment group attempts to surpass former records. Such action is laudable if it is indicative of the advancement of the art of all weather carrier operations or technical and material advancements in aircraft or carrier systems. However, it is wrong if the end result is the compilation of flight hours per se at the expense of safety or maintenance shortcuts which prove costly in the long run. Commander Carrier Division SIX will continue to assess and measure performance strictly in terms of readiness tempered by sound maintenance and safety policies.—*ComCarDiv SIX*

Maintenance Error Prevention

THE following is from a CNAL letter on Aviation Maintenance and is considered worthy of reiteration and dissemination to all aircraft maintenance organizations.

"In an era of sophisticated high performance aircraft with long check-off lists it is obvious that better maintenance is necessary. While the increased complexity of our modern aircraft is a factor, it is noted that a large number of maintenance-error-caused accidents and incidents are due, not to complexity of equipment, but to *lack of supervision and technical knowledge.* Many mistakes are simple ones in routine maintenance. Reduction in damage to aircraft, due to maintenance factors, must and can be attained.

"OpNav Instruction 5400.5A states *'the performance of aircraft maintenance is a responsibility of command'* and, that *'the reporting custodian of an aircraft is responsible for its material condition and operational readiness.'* In the space era of multi-million dollar aircraft vigorous attention must be given to maintenance matters. Operating units and activities must:

"a. Insure that quality control divisions are staffed with the best technical talent to implement and supervise a full time rigorous quality control program.

"c. Insist on firm maintenance administrative training courses to achieve the highest possible state of maintenance capability.

"b. Make maximum use of available maintenance procedures to insure maintenance directives reach their intended user and *are implemented.*

"d. Require full compliance with BuWeps Material Reliability Program in order to provide BuWeps and industry with the tools for improving aircraft maintainability."

Quality Control

FOLLOWING normal takeoff the FJ's landing gear was raised and the flap handle actuated. Shortly thereafter, the starboard drop tank dropped off the aircraft and landed in a swamp about 1000 feet beyond the takeoff end of the runway. No damage was done to the aircraft.

During replacement of the right hand flap actuator flexible shaft 38897960 (Fig. 56 index 41 of AN 01-JKC-4) maintenance personnel failed to properly secure the flex shaft in the area of flap station 47.288. The improper security of the flex

shaft allowed the shaft to whip during flap actuation (both up and down) and engage the drop tank emergency release cable in the area of flap section 47.288 damaging the tank release cable. The whipping and engagement of the flex shaft with the drop tank release cable also actuated the drop tank rear post release mechanism and the tank fell from the aircraft during climbout after takeoff.

The loss of the drop tank at a critical point in flight could have caused a near fatal accident. This was directly caused by improper installation of the flex shaft and negligence of the work inspector. Therefore it is recommended that the Maintenance Department be more selective in designating work inspectors; that the Quality Control Officer, through ground safety and training, make personnel more aware of the results of negligence in work performed.

Inspection Safety Tip

HAND injuries have resulted from two-man inspections of turbine and compressor rotor wheels. This accident usually happens when a mechanic and an inspector are surveying the damage to the wheel. It is a natural tendency for both people to have their hands on the wheel to locate and feel the damage. Usually the damage is on more than one blade and one of the observers will rotate the wheel for further inspection. The other person is unaware of it until he sees the wheel turning. Consequently, he ends up with his fingers caught between the stator or turbine casing before he can lift his hand from the wheel. This accident, or near accident has occurred often enough to warrant its being called to the attention of all persons responsible for making this type of inspection. It can be prevented if only one person will use his hands to rotate the wheel when a two-man inspection is being made.—*American Airlines WML*

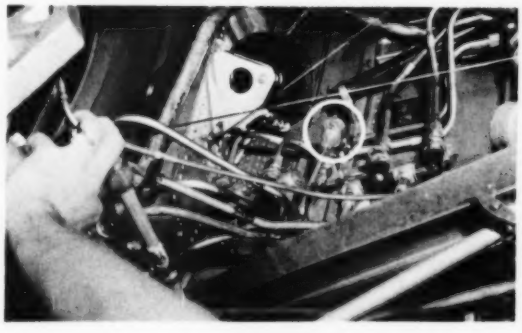
Handbooks—What? Where? When? How?

THERE is a handbook for what, where, when and how that covers any subject in the fields of maintenance, flight, repair, inspection and spare parts. To get an idea of the total number of handbooks required for support of the F3H, take a look at pages 22, 23 and 24 of the NavAer 00-500B Index (March 1960 issue). There are 692 handbooks listed on these three pages. Each of the books contain data for the *Demon* airplane. This will give you a rough idea of the importance of knowing where to look for needed reference material.

Obviously it is impractical for one person to be completely familiar with every book pertaining to every airplane, or even one airplane. However, finding the one needed is greatly simplified by categorization.—*McDonnell Aircraft Field Service Digest*

Gasket Failure Causes Fire

UPON taxiing out of the gear after an arrested landing the tail section of the A4D-2 was observed to be smoking. The pilot immediately secured the



engine. It was determined that on raising the tail hook the gasket in the tail hook up-lock line failed causing a fire in the fuselage.

This is the second case of this nature in the reporting squadron and it is understood there have been four others in the A4D.

The reporting command installed a shield, approximately two inches in diameter over the hydraulic fittings. The sole purpose being to prevent the hydraulic fluid from striking the tail pipe section and causing a fire.

It was also strongly recommended that a permanent fix be evaluated by proper commands and be installed in the hydraulic section of the A4D.

Safe Use of Solvents

WINTER calls for increased emphasis on the safe use of solvents.

Particular attention should be given to ventilation. Many solvents are both toxic and volatile, and most have explosive properties. Death or serious injury may result from inhaling solvent vapors which have become concentrated in unventilated

areas. If open flames are in or near the area, explosions may occur. Therefore, all areas in which solvents are used must be well-ventilated. Since personnel tend to close vents, doors, and windows against the chill of winter, precautions must be taken to assure that every one who handles solvents is aware of the need for adequate ventilation. This information should be a part of the job instructions and orientation of all personnel whose work involves use of solvents. Frequent supervisory reminders and warning posters displayed in work areas will also prove beneficial. —*TIG Brief*

Static-Electricity Hazard

STATIC electricity is an ever-present hazard, particularly acute during dry, cold, winter weather. It is easy to predict the circumstances under which static electricity will occur, but much more difficult to control it. The accident potential is especially critical in areas where storing, loading, or transferring of fuel and other petroleum products takes place.

Continuing study is being given to the problem of control methods; meanwhile, every possible care must be taken to prevent the fires and explosions which threaten when static electricity is discharged in a petroleum-vapor-laden atmosphere, or in close proximity to flammable materials.

The most effective known controls center around proper bonding, grounding, and humidification.

By now, it should be just a matter of checking since these necessary precautions should have been taken long ago. If any doubt exists, the supply and maintenance teams, as well as the supervisor, should refamiliarize themselves with directives cited above, to assure that no destructive accident results from lack of knowledge of proper procedures. Special Orientation of personnel most immediately concerned will also contribute to that alert attitude that eliminates laxity, carelessness, and accidents.—*TIG Briefs*

Handle Up – Gear Up

AN A3D returned to the line with a gripe that the hydraulic pumps would not latch out. Two electricians were assigned to troubleshoot the circuit. In the process of checking this circuit all hydraulic controls were put in the "clean flight" position (bomb-bay closed, speed brakes closed, flaps up, gear up). One of the bomb-bay door switches was observed to be misaligned and was corrected. At this point a starting unit was hooked up to check the operation of the "suspect" bomb-bay doors. The no. 1 ADU was turned ON, supplying hydraulic fluid to the system. The nose wheel locking pin was missing, the landing gear handle was up and the landing gear weston valve cannon plug was connected. The nose wheel immediately retracted.

The reporting command made the following comments: This is a glaring example of the major errors which have been preached against and written about for years, i.e. failure to be aware of and comply with elementary safety precautions, lack of adequate supervision, taking unauthorized maintenance short cuts, etc. No acceptable explanation can be offered for an accident of this nature. Fortunately, no one was injured, and the subsequent salvage operations were smartly handled so that no further damage resulted.

Misled Troubleshooters

WHEN a takeoff was attempted with this P2V the throttles were advanced and the engine reached about 2200 rpm, the engine began cutting out. The aircraft was returned to the line and later placed in the hangar for work on discrepancies.

The crew assigned to troubleshoot the engine thought that ice in the carburetor or screens and venturi might be the cause of the difficulty. The screens and venturi were examined, found to be iced up, the ice was removed and the parts reinstalled in the aircraft.

Later the P2V was turned up on the ramp to determine results of work performed to correct this previous discrepancy. After about 20 minutes of ground run, power was advanced and the propellers and magnetos were checked. When throttles were further advanced until approximately 2250 rpm were obtained, the starboard engine again cut out. Power was reduced to 1200 rpm and the plane captain waited for the engine to cool off before stopping. Shortly after throttling back, the plane captain noticed the man posted outside giving a signal and pointing toward the starboard engine. The plane captain leaned forward and saw that the starboard engine was on fire. By cutting the mixture, the engine was secured and the fire appeared to go out. Switches also were secured and the aircraft abandoned. Ground crewmembers in the ramp area kept the fire under control with fire bottles.

Events connected with this mishap revolve around and are a result of the failure of the intake valve in no. 8 cylinder on the starboard en-

gine. It is probable that this failure took place the previous afternoon and was aggravated when the failed part punctured the piston after continued running of the engine.

The intake valve on no. 8 cylinder had broken at the stem, causing a break on the piston face during the compression or exhaust stroke. Oil plus unburned fuel was then forced into the cylinder during the intake and power strokes and exhausted into the stacks, through no. 1 PRT and out on the nacelle and wheel well door. The burning was probably caused by overlapping burning in the induction system being exhausted through the no. 8 exhaust port. Once fire started, it was continually being fed by fuel and oil from no. 8 cylinder.

The accident board said a diagnosis of ice in the carburetor was substantiated—ice was found in the induction system, so a compression check was not deemed necessary at that time. In the nature of a second guess, a compression check would probably have uncovered the actual malfunction. In any case a more positive method of shutting down the engine would have been to use the firewall shutoff rather than cutting the mixture.

Rely on HMI

BUWEPS has gone to great expense to produce the Handbook of Maintenance Instructions (HMI). In the super six aircraft virtually every maintenance job just be performed with the HMI alongside to check each movement step by step. The complexity of the aircraft dictates this. The general reluctance to accept this procedure, however, still poses as one of the major maintenance headaches. This stems from immature reasoning that it is beneath a mechanic's dignity to stoop to following directions or to "bone up" for a job he has done before.

Some mechs will go to almost any extreme to avoid the HMI. Even in a relatively simple task like changing a hydraulic pump, there are few mechs in the fleet today who can remember or write down the detailed instructions involved. Recently on an extended flight a hydraulic pump installed backward almost resulted in a wheels-up. At the advance base the mech installed another hydraulic pump feeling the first one was bad. Even in the second installation the HMI was never consulted and again it was installed backward. After very long and costly operational delays a new (night crew) mech took over following the detailed steps set forth in the HMI and the simple task was completed. Moral—*always consult and follow your HMI.*

Personal Safety

THE AD-6 aircraft, parked on the flight deck directly behind an AD-5N, was being turned up and checked following a spark plug change. Either negative pressure or vibration caused the rudder batten on the AD-5N to work loose. The batten was sucked into the rotating propeller of the AD-6. A mechanic helping to start the AD-6 aircraft, was struck in the eye with the smaller piece of the batten.

A locally manufactured batten was being used on the AD-5N. The batten was a safety hazard in that it was placed between the bottom of the rudder and the horizontal stabilizer with no means provided to positively secure it to the aircraft.

It is recommended that only the rudder gust lock, which is pictured in the Handbook Maintenance Instructions (AN 01-40ALE-2), be used. If a squadron manufactured gust lock is used it should duplicate part no. 5442806.

The injury sustained, (loss of left eye), would have undoubtedly been less severe if the mechanic had been wearing his goggles down. All personnel involved in flight deck operations are reminded to wear full safety equipment when aircraft are being turned up.

The ingenuity of personnel in the local manufacture of equipment must not be suppressed. However, such equipment should be evaluated and conform to safety standards prior to acceptance for use.

Jet Blast

UPON turn-up the FJ-4B's tail pipe was pointed at the tail of an R4D, which was estimated to be 300 feet away. Upon reaching 100% in manual fuel control condition, the elevators of the R4D were bouncing up and down and the signal was given to throttle back.

Investigation revealed that the nearest point of the R4D was 264 feet from the FJ-4B tailpipe. The R4D received damage as follows: the port elevator and the tailcone were slightly bent, elevator stop assembly damaged, gust locks twisted, and fabric of both elevators torn, requiring total of 62 man hours to repair.

Further investigation revealed that the FJ-4B was parked on a heading of 210 degrees and the wind at this time was south southwest at 10 knots velocity. The temperature at the time of the accident was 102°F.

The HMI and Flight Manual for the FJ-4B aircraft show for maximum engine thrust and at a

distance of 92 feet (the farthest distance given) a jet blast velocity of only 41 knots and a temperature of 130°F. It is assumed these figures are based on a standard day. The same chart states, "If blast deflector not available, area must be clear 200 feet aft of airplane."

A hand anemometer was borrowed from Aerology, and under the same set of weather conditions that existed at the time of the accident an experiment was conducted to check the actual velocity of the jet blast. With an FJ-4 turning up for one minute at maximum engine thrust, the velocity at 264 feet was measured as 41 to 48 knots.

It is suspected that wind on the nose and high ambient temperatures markedly increase the speed and range of jet blast effects.

The R4D gust locks were made of metal, were within tolerance as to size and were installed properly. However, the metal that the gust locks were made of was too soft. This allowed the gust locks to twist and bend under the force of the jet blast to a point where the elevator and aileron slipped by the edge of the gust lock and in so doing were damaged.

Although the speed of the jet blast exceeded that indicated by the Flight Manual for approximately one third the actual distance and was the primary cause of the accident, it is believed that a stronger gust lock would have prevented this accident.

Lock-wire Learning

In its effort to prevent "Boo Boo's" of improper lock-wiring of assemblies, an East Coast unit photographically reproduced the pages from the Structural Repair Manual showing correct lock-wiring techniques. These photos were blown up to poster size and copies placed on bulletin boards in all maintenance spaces and in the hangar.

Pass The Word, Too!

IT'S been said that "signs don't cost—they pay." In most cases this is true but here's a case of "not as advertised."

The bomb-bay doors of an A3D-1Q were in an interim state of repair and were mechanically secured. The work was placarded properly but during the hours of darkness the sign was not observed and the doors were hydraulically activated by the relieving night check crew.

Insure the word is passed on the progress of work before any new job is initiated.

Sloppy Link Installation

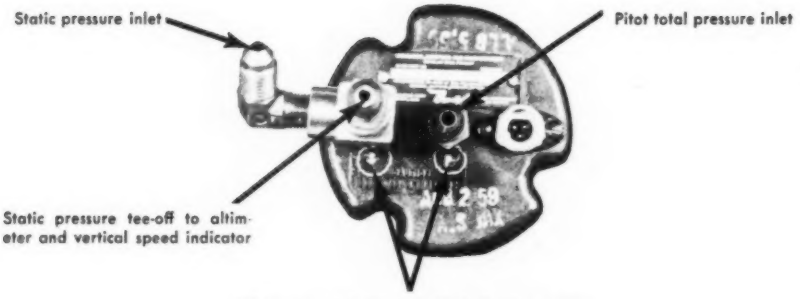
AFTER a transmission change on the aircraft the pilots were conducting a test flight (hovering on flight line) at about 4 feet from the ground. The collective bottomed itself and the pilot could not pull it up; the aircraft turned about 80 degrees to the right followed by a hard landing. The fitting assembly and nose landing gear part No. S-14-20-5130 broke and collapsed denting the structural support.

When the servo was installed on the aircraft, the stack up on the sloppy links was improperly installed. The two spacers part No. S-14-40-5030 were not bottomed in the arm assembly part No. S14-40-5024, allowing the link to move down giving the servo a hard "down" signal.

It has been emphasized to all maintenance inspectors that a thorough inspection is necessary after any work is conducted on the aircraft.

MURPHY'S LAW*

A4D-2 Pitot Static vs Pitot Total Pressure Connectors


Static pressure inlet
Pitot total pressure inlet
Static pressure tee-off to altimeter and vertical speed indicator
White stamped 'S' and 'P' indicating proper connection for *static* and *total* pressure lines

THE airspeed indicator was removed from an A4D-2 during check in order to use the indicator in another aircraft. When the check was completed, and airspeed indicator was re-installed, the aircraft was launched on a test flight from the carrier. No airspeed, altimeter or vertical speed indications were had. The pilot returned and landed, flying wing on another A4D until "meatball" was obtained.

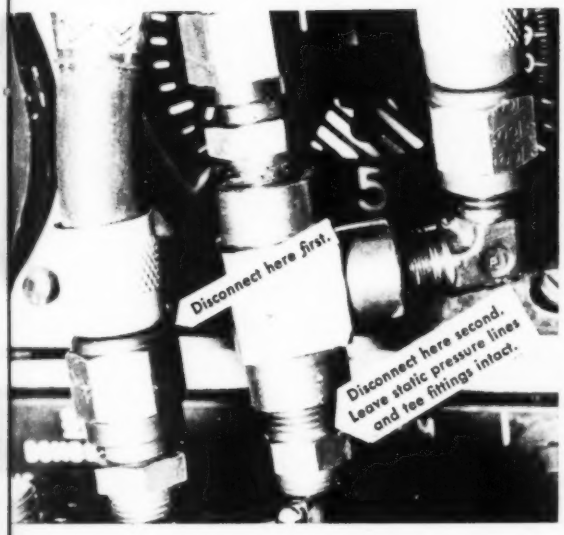
Investigation revealed that the *pitot static* line and the *pitot total pressure* line had been *reversed* and *misconnected* (see photo 2).

Recommendations:

1. MURPHY-PROOF the system by installing different sized fittings on the pitot total pressure line (AN 816-4D and AN 6270-4-24 respectively) to physically preclude mismatching the lines (photo 1 and 3).

2. Since the above is a long-range correction to the problem, and not in the realm of squadron capability to accomplish, this squadron has adopted the following policy, which is recommended as

View showing "Murphied" lines.



View showing correct connection of pitot static and total pressure lines.

being suitable for all A4D squadrons.

a. When disconnecting the lines from the airspeed indicator:

(1) Disconnect the TOTAL PRESSURE LINE (single hose) *first.*

(2) Hold the "Tee" fittings and unscrew the instrument from the fittings thus leaving the Tee fittings and static pressure lines intact. (See photo 3). This procedure makes it very difficult to Murphy the lines when the instrument is re-installed.

3. Last, but most important, do not fail to utilize test equipment in order to ground check the system for proper operation.

Contributed by O. E. Kruger,
Safety Officer VA-106

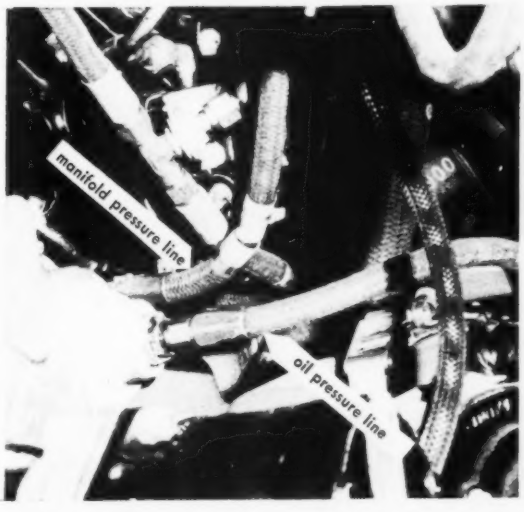
S2F MURPHY

FOLLOWING an R 1820-82 engine change on an S2F-1, the engine was inspected and everything looked normal. On engine runup it was noted that the oil pressure did not come up BUT the manifold pressure gage pegged. The engine was immediately secured and a *thorough* inspection of the entire installation was made.

The inspection revealed that the manifold pressure gage line had been attached to the oil pressure fitting on the engine, and the oil pressure gage line had been connected to the manifold pressure fitting on the engine. (See photo for the correct installation.)

Result? The manifold pressure gage was ruined, the manifold pressure line was contaminated, and there was a possibility of rupturing the manifold pressure line.

These lines are attached to identical fittings on the engine and in approximately the same area of the engine accessory section. Future mistakes of this kind could be avoided by using a no. 4 fitting for one line and a no. 5 fitting for the other.—*Anymouse*



Correct installation of manifold pressure and oil pressure lines.

CLIPBOARD

Black Alert

AN UNUSUAL incident recently occurred in which a starling flew into a hangar with a lighted cigaret butt in its beak, then dropped the lighted butt on the hangar floor (no doubt startled by the no-smoking signs).

This incident could have been serious, had the lighted cigaret fallen into something flammable. All personnel of the squadron concerned have been rebriefed on the importance of extinguishing cigarets before discarding them.

Recommendations: a. That the practice of selling cigarets to birds, (starlings, black) be discontinued. b. That the Personnel Officer procure twelve cats (alley, sure-footed) on an indefinite loan for the purpose of stalking down the birds, (starlings, black).—*Interceptor*

Practice IFR

FOLLOW IFR Procedures Even When Operating VFR—You don't have to follow IFR procedures if you are conducting VFR operations, but you cannot maintain instrument proficiency without practicing at every opportunity. Use all the navigational aids available and make accurate position reports.—*FAA Flight Information Manual*

Maintaining VFR During Practice GCA

PILOTS occasionally have passed through low scud or fog while conducting GCA practice runs under VFR conditions. Even if a pilot is controlled by GCA he must remain VFR if he is filed VFR. If VFR cannot be maintained the pilot should remain clear of the scud or fog advising GCA of his actions and intentions.—*Weekly Summary*

Reduce Communications

TOWER controllers (in this instance, at Chicago Midway Airport) report that pilots can help reduce communications on approach control by advising on their initial contact, that they have wind and runway data. (Some refer to these as "the numbers" . . . either is okay.) This procedure would be appreciated by tower operators in all high-density areas. —*Flight Safety Foundation.*

In Other Words Handle With Care

YOU don't get the increased speed of a jet for nothing. The high performance of the jets is hard to come by in the first place and may be even harder to maintain. High speed means thin airfoils and light evenly balanced control surfaces requiring minimum actuating loads.

Aerodynamic cleanliness is a must and has never been more important than it is on today's airplanes. Parasitic drag and leakage drag can and will constantly nibble away at this aerodynamic cleanliness. Even small discrepancies may become intolerable because of their drag effect which, as you know, increases as the square of the speed.

The amount of drag produced by a small projection or dent is six times greater at 500 mph than it is at 200 mph. Increased drag requires proportional increases in thrust, therefore, increased fuel consumption and decreased range.

It will be essential that all door gaps, seals, air leakages, aerodynamic smoothers, drain tubes, and cowling fits be maintained strictly in accordance with the best aerodynamic standards. Allowing drag build-up to continue unchecked will increase operating costs significantly.—*National Safety Council "Safety Newsletter"*

Trust not the seat of the pants nor the devil in thy soul, but follow thine instructions.

—*RCAF "Flight Comment"*

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CHOOSE IT
Best possible equipment

USE IT
Best possible training

DON'T ABUSE IT
Best possible condition